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THE GRADUATE SCHOOL

2008-2010 RECORD

CAROLINA

THE GRADUATE SCHOOL 2008-2010 RECORD

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

THE GRADUATE SCHOOL

Graduate Record of The University of North Carolina at Chapel Hill 2008-2010

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2008-2010

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The University of North Carolina at Chapel Hill is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Ga. 30033-4097; telephone [404] 679-4501) to award bachelor's, master's, doctoral and professional degrees.

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The University of North Carolina at Chapel Hill is committed to equality of educational opportunity. The University does not discriminate in offering access to its educational programs and activities on the basis of age, gender, race, color, national origin, religion, creed, disability, veteran's status, sexual orientation, gender identity or gender expression. The Dean of Students (Suite 1106, Student Academic Services Building, CB# 5100, 450 Ridge Road, Chapel Hill, N.C. 27599-5100 or [919] 966-4042) has been designated to handle inquiries regarding the University's nondiscrimination policies.

Nondiscrimination Statement
The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, it is therefore the University's policy not to discriminate in offering access to its educational programs and activities or with respect to employment terms and conditions on the basis of age, gender, race, color, national origin, religion, creed, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied (see www.unc.edu/campus/policies/nondiscrim.html). A copy of the University's EPA and SPA Equal Opportunity Plans is available on the University's Web site at www.unc.edu/depts/eooada. Any inquiries regarding the University's nondiscrimination policies should be brought to the attention of one of the following administrators, as noted:

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The University's policy prohibiting discrimination on the basis of sexual orientation does not apply to the University's relationships with outside organizations, including the federal government, the military, ROTC and private employers.

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To Graduate Students and Prospective Graduate Students

The University of North Carolina at Chapel Hill is one of the leading graduate research universities in the United States. As one of the most comprehensive in the nation, Carolina provides a breadth of study and interdisciplinary experience matched by few institutions. There are 66 doctoral-level programs and 102 master's-level programs currently active in The Graduate School.

This catalog provides basic information about these programs. It includes our admission standards and requirements, tuition and other costs, sources of financial aid (including fellowships), information concerning research institutes and centers, and brief descriptions of programs and courses. In addition, you will find under each program description a listing of all graduate faculty in that area together with their specific research interests. Please visit the Graduate School Web site, gradschool.unc.edu, for further information on many of these topics.

The University of North Carolina at Chapel Hill believes that academic excellence is enhanced by the maintenance of a community that includes people from a wide range of ethnic, racial, socio-economic and geographic backgrounds, as well as individuals whose personal attributes will contribute to a richer learning environment. The University is committed to equality of educational opportunity.

In addition to our outstanding faculty, our comprehensive research and library resources and our exceptional facilities, the University has a warm and collegial spirit that is conducive to personal growth and scholarship.

By attending this institution you are becoming an important part of a 200-year-long tradition of excellence in scholarship, research, teaching and public service. We hope that your time here is fruitful, challenging and rewarding.

The Graduate School

Academic Calendar

University Registrar Calendars can be obtained on the Registrar's Web site: regweb.unc.edu.

Mission Statement: The University of North Carolina at Chapel Hill

The University of North Carolina at Chapel Hill has existed for two centuries as the nation's first state university. Through its excellent undergraduate programs, it has provided higher education to 10 generations of students, many of whom have become leaders of the state and the nation. Since the 19th century, it has offered distinguished graduate and professional programs.

The University is a doctoral/research-extensive university. Fundamental to this designation is a faculty actively involved in research, scholarship and creative work, whose teaching is transformed by discovery and whose service is informed by current knowledge. The mission of the University is to serve all the people of the state, and indeed the nation, as a center for scholarship and creative endeavor. The University exists to teach students at all levels in an environment of research, free inquiry and personal responsibility; to expand the body of knowledge; to improve the condition of human life through service and publication; and to enrich the culture.

To fulfill this mission, the University must

- Acquire, discover, preserve, synthesize and transmit knowledge
- Provide high quality undergraduate instruction to students within a community engaged in original inquiry and creative expression, while committed to intellectual freedom, to personal integrity and justice, and to those values that foster enlightened leadership for the state and nation
- Provide graduate and professional programs of national distinction at the doctoral and other advanced levels
- Extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the state and
- Address, as appropriate, regional, national and international needs.

(Approved by the UNC Board of Governors, November, 2003)

The UNC System
History of the University

In North Carolina, all the public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. The University of North Carolina at Chapel Hill is one of the constituent institutions of the multicampus state university.

The University of North Carolina, chartered by the North Carolina General Assembly in 1789, was the first public university in the United States to open its doors and the only one to graduate students in the 18th century. The first class was admitted in Chapel Hill in 1795. For the next 136 years, the only campus of the University of North Carolina was at Chapel Hill.

In 1877 the North Carolina General Assembly began sponsoring additional institutions of higher education, diverse in origin and purpose. Five were historically black institutions, and another was founded to educate American Indians. Several were created to prepare teachers for the public schools. Others had a technological emphasis. One is a training school for performing artists.

In 1931 the North Carolina General Assembly redefined the University of North Carolina to include three state-supported institutions: the campus at Chapel Hill (now the University of North Carolina at Chapel Hill), North Carolina State College of Agriculture and Engineering at Raleigh (now North Carolina State University at Raleigh) and the North Carolina College for Women (Woman's College) at Greensboro (now the University of North Carolina at Greensboro). The new multicampus University operated with one board of trustees and one president. By 1969, three additional campuses had joined the University through legislative action: the University of North Carolina at Charlotte, the University of North Carolina at Asheville and the University of North Carolina at Wilmington.

In 1971 the General Assembly passed legislation bringing into the University of North Carolina the state's 10 remaining public senior institutions, each of which had until then been legally separate: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University and Winston-Salem State University. This action created the current 16-campus University. In l985 the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University, and it recently became a constituent institution.

The UNC Board of Governors is the policy-making body legally charged with "the general determination, control, supervision, management and governance of all affairs of the constituent institutions." It elects the president, who administers the University. The 32 voting members of the board are elected by the General Assembly for four-year terms. Former board chairs and board members who are former governors of North Carolina may continue to serve for limited periods as nonvoting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a nonvoting member.

Each of the 17 institutions, including the high school, is headed by a chancellor, who is chosen by the Board of Governors on the president's nomination and is responsible to the president. Each institution has a board of trustees, consisting of eight members elected by the Board of Governors, four appointed by the governor, and the president of the student body, who serves ex officio. (The North Carolina School of the Arts has two additional ex officio members.) Each board of trustees holds extensive powers over academic and other operations of its institution on delegation from the Board of Governors.

The University of North Carolina: Constituent Institutions

Universities

Appalachian State University
www.appstate.edu

East Carolina University
www.ecu.edu

Elizabeth City State University
www.ecsu.edu

Fayetteville State University
www.uncfsu.edu

North Carolina Agricultural and Technological State University
www.ncat.edu

North Carolina Central University
www.nccu.edu

North Carolina School of the Arts
www.ncarts.edu

North Carolina State University
www.ncsu.edu

University of North Carolina at Asheville
www.unca.edu

University of North Carolina at Chapel Hill
www.unc.edu

University of North Carolina at Charlotte
www.uncc.edu

University of North Carolina at Greensboro
www.uncg.edu

University of North Carolina at Pembroke
www.uncp.edu

University of North Carolina at Wilmington
www.uncwil.edu

Western Carolina University
www.wcu.edu

Winston-Salem State University
www.wssu.edu

High School

North Carolina School of Science and Mathematics
www.ncssm.edu

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Robert E. Phay, J.D., *Director, World View*

Finance and Administration
Richard L. Mann, Ph.D., *Vice Chancellor, Finance and Administration*
Carolyn W. Elfland, M.B.A., C.P.A., *Associate Vice Chancellor, Campus Services*
Michael Freeman, B.A., *Director, Auxiliary Services*
John T. Jones, B.A., *Director, Campus Merchandising*

Alvin Garner, *Manager, Carolina Copy*
Ray DuBose, B.S., *Director, Energy Services*
Mary Beth Koza, *Director, Environment, Health and Safety*
Brandon Thomas, *Director, Facilities Services*
Paul J. Burke Jr., B.A., *Manager, Horace Williams Airport*
Craig Hyatt, *Director, Information Services*
Susan J. Anderson, B.S., *Director, Printing Services*
Jeffrey McCracken, M.P.A., *Chief of Police and Director, Public Safety*
Derek W. Lochbaum, M.S., *Director, Trademark Licensing*

Bruce L. Runberg, M.S. Civil Eng., M.S. Mgmt., *Associate Vice Chancellor, Facilities Planning and Construction*
Edd H. Lovette Jr., *Director, Building Services*
Edward B. Phillips, *Director, Business Operations*
Sidney W. Stone, *Director, Construction Management*
Luke Hoff, *Director, Architectural and Construction Services and Work Management*
Abbas Piran, M.B.A., *Director, Engineering Information Services*
Anna Wu, M.S., *Director, Facilities Planning*
Kirk Pelland, M.S., *Director, Grounds Services*
Garland Burton, B.S., *Coordinator, Historically Underutilized Businesses (HUB)*
William T. Burston Jr., B.S., *Director, Housekeeping Services*
Tracy Agnew, *Director, Personnel Services*
Cindy P. Shea, *Director, Sustainability Office*

Roger D. Patterson, B.B.A., *Associate Vice Chancellor, Finance*
Dennis A. Press, M.B.A., C.P.A., *University Controller*
Chandrika Rao, *Director, Accounting Services*
Janet Kelly-Scholle, *Director, Finance Communications and Training*
McGregor Bell, *Director, Budget Office*
Mark Sillman, *Director, Contract Services and Stores*
David Blakemore, *Director, Financial Reporting and Management Services*
Mark Kozell, *Director, Financial Systems and Controls*
Martha J. Pendergrass, B.A., C.P.A., *Director, Material and Disbursement Services*
Betsi Snipes, *Director, Payroll Services*
Bernard Law, *Director, Purchasing Services*
Steve Kenny, *Director, Risk Management Services*
DeAhn H. Baucom, M.A.C, C.P.A., *Director, Student Accounts and University Receivables*
Brian Smith, B.A., C.F.A., C.T.P., *Director, Treasury and Risk Management Services*

Brenda R. Malone, J.D., *Associate Vice Chancellor, Human Resources*
Matthew S. Brody, M.S., *Assistant Vice Chancellor, Human Resources*
Ashley Nicklis, *Director, Benefits Operations*
Vacant, *Director, HR Business Analysis*
Dee Perry, *Business Manager, HR Business Office*
Gena Carter, *Acting Senior Director, Employee and Management Relations*
Victoria Bradley, Ph.D., *Senior Director, Employment and Compensation*
Claire Miller, M.A., *Senior Director, Planning, Policy and Development*
Brian Usischon, *Senior Director, Benefits and Employee Programs*
Kathy Bryant, B.A., *Director, HR Communications*
Lorri Allison, M.S., *Director, HR Employee Services*
Chris Chiron, M.A., *Director, Policy Administration, HR Employee Services*
Dave Turner, B.A., *Senior Director, Administration and Systems*
Stephanie Sykes, *Director, HR Records and Information*
Rob Kramer, M.S., *Director, HR Training and Development*
Joe Marro, *Director, Compensation and Staffing Programs*
Theresa Silsby, *Director, HR Application Support*
Paul Ingui, *Manager, Tar Heel Temps*
Jessica Moore, *Director, ECC-Health Affairs*
Linc Butler, B.S., *Director, ECC-Academic and Administrative Affairs*

Dwayne Pinkney, Ph.D., *Assistant Vice Chancellor for Finance and Administration and Special Assistant to the Chancellor for State and Local Relations*

Office of University Counsel

Leslie Chambers Strohm, J.D., V*ice Chancellor and General Counsel*
Patricia C. Crawford, J.D., *Associate Vice Chancellor and Deputy General Counsel*
David M. Parker, J.D., *Associate Vice Chancellor and Deputy General Counsel*
Joanna Carey Cleveland, J.D., *Associate University Counsel*
William Fletcher Fairey, J.D., *Associate University Counsel*
Mary P. Sechriest, J.D., *Associate University Counsel*

Information Technology Services

Larry D. Conrad, M.S., *Vice Chancellor and Chief Information Officer*
Robyn C. East, *Associate Vice Chancellor and Deputy Chief Information Officer, Acting Associate Vice Chancellor for Enterprise Applications*
John L. Oberlin, M.B.A., *Associate Vice Chancellor*
Audrey Ward, *Assistant Vice Chancellor, Communications*
Stephanie Szakal, *Assistant Vice Chancellor, Enterprise Resource Planning*
William Cameron, *Assistant Vice Chancellor, Information Security*
Judson Knott, B.S.C.S., *Assistant Vice Chancellor, Infrastructure and Operations*
Charles Green, *Assistant Vice Chancellor, Teaching and Learning*
John Streck, *Assistant Vice Chancellor, Telecommunications*
Priscilla Alden, *Assistant Vice Chancellor, User Support and Engagement*
Tom Horne, *Interim Director, Administration*
Paul Jones, M.F.A., *Director, ibiblio*

Medical Affairs

William Roper, M.D., *Vice Chancellor, Medical Affairs; CEO, UNC Health Care System; Dean, School of Medicine*

Public Service and Engagement

Michael R. Smith, J.D., *Vice Chancellor, Public Service and Engagement and Dean, School of Government*
Lynn W. Blanchard, Ph.D., *Director, Carolina Center for Public Service*
Jenny Huq, B.A., *Director, APPLES Service-Learning Program*

Research and Economic Development

Tony G. Waldrop, Ph.D., *Vice Chancellor, Research and Economic Development*
Barbara Entwisle, Ph.D., *Director, Carolina Population Center*
Timothy S. Carey, M.D., *Director, Cecil G. Sheps Center for Health Services Research*
Alice S. Ammerman, Dr.P.H., *Director, Center for Health Promotion and Disease Prevention*
John F. Bradfield, D.V.M., Ph.D., *Director, Division of Laboratory Animal Medicine*
Jesse L. White Jr., Ph.D., *Director, Office of Economic and Business Development*

Karen Regan, J.D., *Director, Office of Federal Affairs*
Sam Odom, Ph.D., *Director, FPG Child Development Institute*
David L. Harkey, P.E., *Director, Highway Safety Research Center*
Daniel K. Nelson, M.S., *Director, Office of Human Research Ethics*
Carol W. Runyan, Ph.D., *Director, Injury Prevention Research Center*
Joseph M. DeSimone, Ph.D., *Director, Institute for Advanced Materials, Nanoscience and Technology; Director, NSF Science and Technology Center for Environmentally Responsible Solvents and Processes*
Victor W. Marshal, Ph.D., *Director, Institute on Aging*
Tracy M. Heenan, D.V.M., *Director, Office of Institutional Animal Care and Use*
Kenneth A. Bollen, Ph.D., *Director, Odum Institute for Research in Social Science*
Sibby Anderson-Thompkins, M.S., *Director, Office of Postdoctoral Affairs*
Alan R. Blatecky, M.A., M.B.A., *Interim Director, Renaissance Computing Institute*
Jacqueline Resnick, B.S., *Director, Office of Research Development*
Scott R. Daugherty, J.D., *Executive Director, Small Business and Technology Development Center*
Catherine Innes, B.S., *Director, Office of Technology Development*
W. Mark Crowell, M.R.P., *Associate Vice Chancellor, Economic Development and Technology Transfer*
Robert P. Lowman, Ph.D., *Associate Vice Chancellor, Research*
Andrew S. Johns, *Assistant Vice Chancellor, Research; Director, Office of Research Information Systems*
Neil Caudle, M.S., *Associate Vice Chancellor, Research; Director, Office of Information and Communication*
James E. Peterson, Ph.D., *Associate Vice Chancellor, Research; Director, Office of Sponsored Research*
Kelly Musty, *Director, Award Management*
Hamilton Brown, *Director, Proposal Management*
Hilda Durham, *Director, Financial Reporting and Cash Management*
Phyllis Daugherty, *Director, Training and Development*
Kevin Maynor, *Director, Cost Analysis and Compliance*
Richard A. Luettich, Sc.D., *Director, Institute of Marine Sciences*
Barbara Longmire, M.S.N, *Director, Office of Clinical Trials*
Carolyn Marlow, *Director, Sponsored Programs Office, School of Medicine*

Student Affairs

Margaret A. Jablonski, Ed.D., *Vice Chancellor, Student Affairs*
Melissa E. Exum, Ph.D., *Associate Vice Chancellor, Student Affairs, Dean of Students*
Winston Crisp, J.D., *Assistant Vice Chancellor, Student Affairs*
Virginia Carson, J.D., *Director, Campus Y*
John Mendoza Brodeur, M.Ed., *Director, Carolina Leadership Development*
Donald E. Luse, M.Ed., *Director, Carolina Union*
James Kessler, M.A., *Director, Disability Services*
Jenny Levering, M.A., *Assistant Dean of Students, Fraternity and Sorority Life*
Terri Phoenix, *Director, LGBTQ Center*
April Mann, *Director, Office of New Students and Carolina Parent Programs*
Deborah Horne, *Director, Student Activities Fund Office*
Christopher A. Payne, Ph.D., *Associate Vice Chancellor, Student Affairs*
Mary Covington, M.D., *Assistant Vice Chancellor, Campus Health Services*
Patricia Huff, Pharm.D., *Director of Administration, Campus Health Services*
Joan Potter, M.D., *Director, Clinical Services*
Allen Hamrick O'Barr, *Director, Counseling and Wellness Services*
Marty Pomerantz, *Director, Campus Recreation*
Timothy Taft, M.D., *Director, Sports Medicine/Orthopedics*
Brian Payst, *Director, Technology and Systems Support*
Marcia B. Harris, M.Ed., *Director, University Career Services*
Larry M. Hicks, *Director, University Housing and Residential Education*
Sarah W. Jonczak, C.P.M., *Assistant Vice Chancellor, Student Affairs*
Jim Ervin, *Director, Development and External Affairs*

University Advancement

Matthew G. Kupec, M.Ed., *Vice Chancellor, University Advancement*
Elizabeth Dunn, Ph.D., *Senior Associate Vice Chancellor, Development*
Beth G. Braxton, B.A., *Director, Annual Fund*
Mark Meares, B.A., *Director, Corporate and Foundation Relations for Academic Affairs*
Helen N. Snow, M.B.A., *Director, Corporate and Foundation Relations for Health Affairs*
Scott Ragland, M.F.A., *Director, Development Communications*
Janice Proffit, *Director, Development Research*
Andi Sobbe, B.A., *Director, Donor and Prospect Relations*
Diane Frazier, B.A., *Director, Major Gifts*
David Routh, B.A., *Director, Planned Giving*
Carolyn Atkins, B.S., *Director, Stewardship*
June Steel, M.B.A., *Associate Vice Chancellor, Advancement Services*
Jean M. Vickery, B.A., *Associate Vice Chancellor, Information Technology*
Nancy K. Davis, B.A., *Associate Vice Chancellor, University Relations*
Linda Douglas, A.B., *Director, Community Relations*
Jessica Schaefer, B.F.A., *Director, Design Services*
Patty Courtright, *Editor, University Gazette; Director, Internal Communications*
Linda Convissor, M.R.P., *Director, Local Relations*
Jonathon Howes, M.P.A., *Special Assistant to the Chancellor*
Lisa Katz, B.A., *Director, News Services*
Michael McFarland, M.A., *Director, University Communications*
Laura H. Morgan, B.A., *Director, University Events*
Missy Julian Fox, M.Ed., *Director, Visitors Services*
H. Scott Jared, B.S., *Director, Web Content*
Robert B. Levin, *Chief Operating Officer and Interim General Manager, WUNC(FM) Radio*

Athletics

Richard A. Baddour, M.A., *Director, Athletics*

Also Reporting to the Chancellor

Dwayne Pinkney, Ph.D., *Special Assistant to the Chancellor for State and Local Relations and Assistant Vice Chancellor for Finance and Administration*
Phyllis Petree, B.S., C.P.A., *Director, Internal Audit*
Ann E. Penn, M.A., *Equal Opportunity/ADA Officer*
Wayne Blair, M.A., *University Ombudsperson*
Laurie Mesibov, J.D., *University Ombudsperson*

The UNC System: UNC-Chapel Hill Administrative Board of the Graduate School

Victoria Bautch, Ph.D.
Professor of Biology (2009)

Michel Gagne, Ph.D.
Professor of Chemistry (2011)

Anthony Hickey, Ph.D.
Professor of Pharmacy (2011)

Anne Johnston, Ph.D.
Professor of Journalism and Mass Communication (2011)

Tom Kawula, Ph.D.
Associate Professor of Microbiology (2009)

Douglas MacLean, Ph.D.
Professor of Philosophy (2011)

Terence McIntosh, Ph.D.
Associate Professor of History (2009)

Robert Nicholas, Ph.D.
Professor of Pharmacology (2011)

George Noblit, Ph.D.
Professor of Education (2010)

Della Pollock, Ph.D.
Professor of Communication Studies (2011)

Anna Scheyett, Ph.D.
Clinical Associate Professor of Social Work (2011)

Edgar Shields, Ph.D.
Associate Professor of Exercise and Sport Science (2011)

Helen Tauchen, Ph.D.
Professor of Economics (2010)

Beverly Taylor, Ph.D.
Professor of English (2011)

Terms expire July 31 of the year indicated.

Student Representative

Kyle Richardson
Graduate and Professional Student Federation

Ex Officio

Sarah Michalak, Ph.D.
Director of Academic Affairs Libraries and Associate Provost for University Libraries

The Chancellor and the Provost also are ex officio members of the Board.

The Graduate School

Steven W. Matson, Ph.D.
Dean

Sandra H. Hoeflich, Ph.D.
Associate Dean for Interdisciplinary Education, Fellowships and Communication

Stephanie Schmitt, M.P.A.
Associate Dean for Academics

Leslie Lerea, Ph.D.
Associate Dean for Student Affairs

The UNC System: UNC-Chapel Hill Staff of the Graduate School

Shalonda Arnold
Information Office Manager

Katie Biasi
Donor and Fellowship Services Coordinator

Trish Bunn
Director of Administration and Residency Manager

Diane Davis
Manager, Admissions Office

Kathy Farinola
Dean's Assistant/Special Projects Coordinator

Betty Haggerty
Admissions Processor

Sandra Hoeflich
Associate Dean for Interdisciplinary Education, Fellowships and Communication

Alan Kendrick
Director, Minority Recruitment and Retention

Mary Anne Larson
Director, Office of Development

Leslie Lerea
Associate Dean for Student Affairs

Steven Matson
Dean

Lou Anne Phelps
Enrolled Students Assistant

Bryan Rybarczyk
Director, Graduate Student Academic and Professional Development

Stephanie Schmitt
Associate Dean for Academics

Jamie Snow
Program Review/Student Services Coordinator

Cheryl Thomas
Director, Admissions and Student Records

Ginger Tompkins
Admissions Processor

Rachell Underhill
Web and Information Manager

Scott Wilber
Systems Analyst

Nancy Wines
Enrolled Students Assistant

Beverly Wyrick
Director, Office of Fellowships and Tuition Awards

Amy Yonai
Fellowship Coordinator

UNC-Chapel Hill General Information

History

The University of North Carolina at Chapel Hill was the first state university to admit students. It was chartered in 1789 and formally opened in 1795; from early in its history, it has encouraged research and creative activity.

As early as 1853–54 the catalog of the University carried an announcement of graduate course work. In 1876, after the institution had been closed for the period 1871–75, the catalog announced the requirements for the master's degree, and the next issue carried an announcement of regulations governing the degrees of master of arts, master of science and doctor of philosophy. Several graduate degrees were awarded before the turn of the century (the first degree of doctor of philosophy being conferred in 1883), but it was not until 1903 that a separate graduate school with a dean was established.

The Graduate School celebrated its 100th year in 2003 by hosting a national forum on graduate education, numerous student and alumni recognition ceremonies, and by commissioning the book *Pioneer to Powerhouse: The History of Graduate Education at Carolina*.

In 1922, the graduate faculty voted, first, to vest in the Administrative Board of The Graduate School legislative powers in matters that affected graduate education; second, to authorize the Administrative Board to admit members to the teaching faculty of The Graduate School; and, third, to vest in the Administrative Board the responsibility for authorizing curricula and courses carrying graduate credit.

With the exception of the master of business administration (M.B.A.), the master of accounting (M.A.C.), the master of school administration (M.S.A.) degree in educational leadership and the doctor of education (Ed.D.) degree program in educational leadership, all master's degrees offered by the University and the degrees of doctor of philosophy and doctor of public health are conferred by The Graduate School.

Work toward advanced degrees at the University of North Carolina at Chapel Hill proceeds under policies and regulations established by the graduate faculty. The immediate direction of The Graduate School is in the charge of the Administrative Board, of which the dean is chair. At present, the board consists of academic and health affairs faculty representatives appointed by the chancellor upon nomination by the dean of The Graduate School.

The Summer School

The University of North Carolina at Chapel Hill established one of the first summer schools in America in 1877. The "Summer Normal School," as it was then called, enrolled 235 students in courses over 10 different disciplines. About half the students were teachers; students came from 42 counties across North Carolina and from some neighboring states. The Summer School was the first to enroll women as university students and has continued this equal admission policy throughout its history. By 1925, records indicate that 19,983 students had enrolled in summer school at UNC-Chapel Hill.

Curricula and courses that are offered during summer school are comparable to those of the fall and spring semesters. The Summer School is divided into two regular sessions of five and one-half weeks each and a special session that includes short courses, institutes, workshops, etc., with various beginning and ending dates. The summer program is planned to meet the needs of graduate students who are fulfilling degree requirements in this institution, visiting graduate students who desire to take courses for transfer to other institutions, teachers and administrators who desire to meet state certification requirements and other students who have special educational objectives.

Graduate students who wish to be admitted or readmitted in the Summer School to a degree program should write to the dean of The Graduate School. The requirements for admission to a degree program starting in the summer are the same as those in the regular academic year. Those who desire a copy of the *Summer School Catalog*, or other information, or those wanting to enroll in the summer as visiting students should visit the Summer School's Web page at www.unc.edu/depts/summer, or write to the dean of the Summer School, The University of North Carolina at Chapel Hill, CB# 3340, 134 East Franklin Street, Room 200, Chapel Hill, N.C. 27599-3340, or telephone (919) 966-4364; fax (919) 962-2752.

Visiting Scholars

Registration as a visiting scholar at the University of North Carolina at Chapel Hill entitles the registrant to certain privileges of the University, the issuance of a UNC One Card and the use of University facilities for the duration of the visiting scholar's stay.

Eligibility for registration as a visiting scholar is limited to those who (1) are not on the University payroll as employees in any capacity, and (2) are visiting the University under the sponsorship of an academic department or school for the furtherance of scholarly interests. Visiting Scholars may include faculty members on leave from other institutions of higher learning, postdoctoral fellows or others who hold the terminal degree in their fields and are invited to visit by a department or school.

Persons interested in applying for visiting scholars status should communicate with the appropriate department or school within the University. Further details concerning University privileges for visiting scholars are available from the EPA/Faculty Benefits Office, CB# 1045, 725 Martin Luther King Jr. Boulevard, Chapel Hill, N.C. 27599-1045.

The University Year

Two semesters of approximately 17 weeks each and a summer school consisting of two sessions (each five and one-half weeks long) constitute the University year. The requirements for admission to graduate programs and for graduate degrees in the summer session are the same as those in the regular academic year. For the schedule of events of particular interest to graduate students, consult the academic calendars at the Office of the University Registrar (regweb.unc.edu).

Admissions and Financial Information

General Admissions Information

Welcome. We are pleased that you are considering applying for admission to the UNC-Chapel Hill Graduate School. For the most updated admissions information, please check our Web site at gradschool.unc.edu/admissions.

Application

Required materials for all applicants include:

- Graduate School application (gradschool.unc.edu/admissions/instructions.html#app)
- Application fee (gradschool.unc.edu/admissions/instructions.html#fee) (nonrefundable $75)
- Transcripts (gradschool.unc.edu/admissions/instructions.html#transcripts) (complete, not selected courses)
  - One official copy should be sent to The Graduate School (plus certified English translation if not issued in English)
  - One official copy should be sent directly to the program
- Current letters of recommendation (gradschool.unc.edu/admissions/instructions.html#ltrs) (three letters sent directly to the program according to their delivery instructions)
- Standardized test scores (gradschool.unc.edu/admissions/instructions.html#tests) (GRE, GMAT, etc.; no more than five years old. Some programs also require a GRE subject test.)
- Statement of purpose (gradschool.unc.edu/admissions/instructions.html#purpose)
- Supplemental information (any additional information or materials required by the program; contact your program of interest for this information)

For international applicants only:

- TOEFL score (gradschool.unc.edu/admissions/instructions.html#toefl) (no more than two years old)
- Financial certificate (gradschool.unc.edu/admissions/instructions.html#fincert) (U.S. Immigration requirement for entry into the United States)

Once we have received all required application materials, the review and evaluation of your application will begin. While the various components of your application will likely arrive at The Graduate School at different times, it is your responsibility to make sure the entire application is complete prior to the deadline.

Application for admission can be made online at https://admissionsapp.unc.edu/grad/DEFAULT.ASP. Once an account is created, applicants may return to their application at any time to complete the application and view the current status of materials submitted.

Admission Criteria

Admission to Graduate School academic programs is competitive and students are selected on the basis of their academic preparation, ability and program fit. The minimum requirements for admission to a graduate program are:

- A bachelor's degree (based on a four-year curriculum) completed before graduate study begins or its international equivalent with an accredited institution
- An average grade of B (cumulative GPA 3.0) or better

Along with these minimal requirements, admission decisions are based on a number of factors, including academic degrees and record, written statement of purpose, letters of recommendation, test scores and relevant work experience. All admission decisions are made by each individual program or department.

Application Due Dates

Most programs admit students for the fall semester only. Some programs allow spring admission and a few begin in one of the summer sessions. Please be aware that each program has a specific application deadline. See the full listing at gradschool.unc.edu/programs/degreeprograms.html. Complete fall applications are due January 1 for applicants who wish to be considered for Graduate School funding. Applications received after the January 1 deadline will be considered for fellowships as funds remain available. The Graduate School recommends that international applicants submit a complete application for fall no later than December 1. Students seeking admission for the spring semester should file applications no later than October 15 (September 15 for international applicants).

Application Fee

A nonrefundable $75 application fee is required for each program to which you apply, up to a maximum of three per academic year.

You can pay your application fee by credit card (Visa/MasterCard) or mail a check or money order made payable to the University of North Carolina at Chapel Hill. Mail-in payments are restricted to a check (in U.S. funds) that contains the preprinted electronic routing numbers, or an international money order made payable to the University of North Carolina at Chapel Hill. Please include your full name, birth date and program to which you applied.

Applications that arrive without the required application fee will remain on file, unprocessed, pending receipt of the application fee. If someone is paying the application fee for you, please ask him or her to include your name as the intended applicant when s/he submits the check or money order.

There are several categories of applicants who may qualify for an application fee waiver. Fee waiver requests are considered for:

1) Permanent full-time UNC-Chapel Hill employees
2) Current McNair Scholars applying for a graduate program to begin immediately following graduation, with no breaks in enrollment from undergraduate to graduate level, and
3) U.S. citizens who are currently enrolled in a degree program with no breaks in enrollment from the point of entry at the undergraduate level, have continuously received need-based aid and have had no breaks in financial support since the onset of the support

4) Summer Pre-Graduate Research Experience (SPGRE) participants applying for a graduate program to begin immediately following graduation with no breaks in enrollment from undergraduate to graduate level (only written official verification signed on letterhead by the current SPGRE director or program coordinator will be considered)

We will be happy to consider your waiver request if you can satisfy these criteria and upon receipt of the required letter of certification. While participation in select scholarship programs or payment waivers granted by other sources do not automatically grant fee waiver eligibility at this campus, we welcome fee waiver requests from participants who meet the above need-based eligibility criteria. Requests must be current with no break in enrollment. Please present a copy of these instructions to the representative at all institutions that you attended. Request a letter on University letterhead with an original signature certifying the specific items listed above. (No form letters, photocopies or financial aid transcripts, please.)

This documentation must cover both your enrollment history and financial aid history from point of entry at the undergraduate level. No other forms of documentation can be accepted. Your application will remain on file, unprocessed, pending receipt of the required documentation. Applicants should select pay by check followed immediately by the required documentation listed below. Fee waiver requests must be received before the deadline for any application to be considered.

Transcripts

Two official transcripts of all post-secondary education (including community colleges, summer sessions and extension programs) are required. Transcripts should bear the signature of the institution's registrar and the seal of the institution. Records must be complete (not select courses), issued in the original language and accompanied by certified English translations when applicable. Transfer credit posted on the transcripts of other institutions is not accepted in lieu of transcripts from the institution attended. An original transcript from each institution* is always required.

**Internal (unofficial) transcripts are only acceptable from UNC-Chapel Hill. Please ask the UNC-Chapel Hill University Registrar for an internal transcript at no charge.*

Send one original transcript to The Graduate School (CB# 4010, Chapel Hill, N.C. 27599-4010). Send the other original transcript to your program(s) of interest.

You may submit transcripts before mid-year grades are posted, although final transcripts must then follow. If possible, submit your official transcripts (in sealed envelopes) at the same time as your application. If the institution will not release official transcripts directly to you, they may send the transcripts directly to The Graduate School.

Letters of Recommendation

Three current letters of recommendation from persons qualified to evaluate your academic and professional qualifications are required. You should solicit recommendations from individuals who are familiar with your academic achievement and who can address your potential for success in this particular academic setting. If you have been out of school for a number of years and are unable to contact former professors, letters from other individuals who can address your achievement and potential will be accepted. We advise against using generic letters of recommendation such as those provided by campus career planning and placement offices.

Depending on your intended program's procedures, letters will be requested as either online submissions or hardcopy via U.S. post. Please check your specific program's requirements and instructions for submitting letters of recommendation.

Standardized Test Scores

Official GRE General Test scores (or GMAT, MCAT, etc., if accepted by your intended program) are required for applicants to all programs except Studio Art, Dentistry (except Oral Biology), and Dramatic Art. Some programs also require scores from the Subject Test.

We recommend that you plan to take any required exams no later than October to allow time for scores to arrive in time for consideration for fall admission.

Standardized test scores must be official and reported directly by the Educational Testing Service (ETS, www.ets.org). They must be current and no more than five years old. Standardized test scores that are submitted to this institution are kept on file for only one year.

When you register for any tests, you should indicate the University of North Carolina at Chapel Hill Graduate School (institution #5816) as a score recipient. If you did not specify the UNC-Chapel Hill Graduate School as a score recipient at the time of taking the test, you must promptly ask ETS to send your scores to us (institution #5816). No departmental code is required. While photocopies of score reports are useful for informal evaluation, the official report of your scores must arrive before final review and admission can be offered. GMAT scores should be sent to UNC (c/o KFBS) Program Code D40-HL-(select appropriate major code).

Applicants who already hold a doctoral degree may be exempted from the standardized test score requirement at a program's request. Applicants near completion of a doctoral degree may request an exemption based on the receipt of appropriate degree verification status from the university registrar of the institution. If the degree or official verification is not received, the standardized scores will remain a requirement.

International applicants must also submit official TOEFL standardized test scores (see below).

Statement of Purpose

Most graduate programs require a written statement as part of your application. Your statement should be uploaded electronically within the online application or mailed directly to the program to which you are applying, depending on the program's specific instructions.

The form and content requirements also vary by program, so before applying, please read the information and instructions specific to your intended program. Your written statement is a critical component of your application for admission, and can sometimes be the determining factor in approval of admittance or financial support. Therefore, your statement should reflect your professional goals, as well as familiarity with the program and faculty at UNC-Chapel Hill.

Campus Safety Information

Applicants for admission will be asked several questions regarding criminal pleas, charges and convictions, academic suspensions and military discharges. Transcripts from every college or university attended must be provided. If additional information is needed, you may be asked to submit information for a criminal background check, including a nominal fee. You must describe violations of law in your home country and in any other country in which you have resided.

The term "law" includes codes, legal rules and regulations, and other criminal-type statutes or violations of municipal, local, provincial, state, federal, national, commonwealth and other governmental jurisdiction. Failure to provide complete, accurate and truthful information will be grounds to deny or withdraw your admission, or to dismiss you after enrollment. The same actions will occur if you fail to notify the Admissions Office promptly in writing of such charges that occur at any time after you submit the application.

Instructions for Submitting Your Application

Applicants are responsible for directing the materials appropriately and according to the instructions provided below. Failure to direct materials appropriately may result in delays in the processing of your application.

Electronic submission to The Graduate School: The Graduate School prefers to receive applications online; those received with the application fee (paid by credit card) are processed the next business day.

- Official application
- Application fee, paid by credit card as instructed in the online application

Paper materials mailed to The Graduate School (CB# 4010, Chapel Hill, N.C. 27599-4010):

- Application fee, paid by check or money order in U.S. funds
- One official copy of all transcripts (complete, not selected courses), plus certified English translation if not issued in English

Paper materials sent directly to the specific program of interest (attn: Director of Graduate Admissions):

- Three letters of recommendation (submitted on paper or electronically depending on program and application instructions)
- One official copy of all transcripts (complete, not selected courses)
- Financial certificate (international applicants only)
- Supplemental information or materials required by your program (personal statements, writing samples, portfolios, etc.—submitted on paper or electronically depending on program and instructions within online application)

Application Status

You may monitor the status of your application at: admprosapp2.admissions.unc.edu/grad.

You may look up your personal identification number at: https://s4.its.unc.edu/SISMisc/pidwmp.

Special Information for International Applicants

The University of North Carolina at Chapel Hill encourages a diverse student body and welcomes applicants from all over the world. Together with the instructions above, international applicants should also submit two additional pieces of information with their application. The Graduate School understands it is difficult and sometimes confusing to apply to universities in another country, and we will assist you in clarifying requirements whenever possible.

TOEFL Score

All international applicants must submit acceptable, official (reported directly from the Educational Testing Service) Test of English as a Foreign Language (TOEFL) scores.

We recommend that you plan to take any required exams no later than October to allow time for scores to arrive in time for consideration for fall admission.

Standardized test scores must be official and reported directly by the Educational Testing Service (ETS, www.ets.org). TOEFL scores are reportable for a period of two years from the date of the exam. Exam results more than two years old will not be reported by ETS, and thus cannot be considered. Standardized test scores that are submitted to this institution are kept on file for only one year.

When you register for any tests, you should indicate the University of North Carolina at Chapel Hill Graduate School (institution #5816) as a score recipient. If you did not specify the UNC-Chapel Hill Graduate School as a score recipient at the time of taking the test, you must promptly ask ETS to send your scores to us (institution #5816). Their address is TOEFL, CN6151, Princeton, N.J. 08541-6151. While photocopies of score reports are useful for informal evaluation, the official report of your scores must arrive before final review and admission can be offered.

There are several categories of applicants who may qualify for an exception to the TOEFL exam:

- Those from countries where English is the SOLE OFFICIAL language of instruction (Australia, Bahamas, Barbados, Canada—except Quebec, England, Ghana, Ireland, India, Jamaica, Kenya, New Zealand, Nigeria, Scotland, St. Vincent and the Grenadines, Trinidad, Tobego, Uganda and Wales)
- Those who have received or will receive a degree from an accredited university in the United States. (If you are currently enrolled at a U.S. institution, you must submit an official transcript or verification of degree candidate status from that institution to qualify for a TOEFL waiver. If the degree or an official verification is not received, the TOEFL score will again be required.)

The required minimum total score on the computer-based TOEFL exam is 213 with a minimum score of 18 in each subsection. The required minimum total score on the paper-based TOEFL exam is 550 with a minimum of 50 in each section. The required minimum total score on the Internet-based TOEFL exam is 79. Some programs have their own minimal score requirements which are higher than those stated above, in which case these higher standards will be required.

All newly admitted international students are required to take an English proficiency exam prior to enrolling for classes. Individuals who fail to achieve a passing score on this exam are required to register for a noncredit English course (ENGL 601) their first semester of enrollment. Failure to take the test and/or register for the required course will prevent future registrations.

Financial Certificate

A completed financial certificate (gradschool.unc.edu/documents/2008-09financialcertificate.pdf) and supporting materials must be submitted directly to the program to which you are applying. In order to meet U.S. Immigration requirements for entry into the United States, proof of sufficient financial resources to cover educational and living expenses for the duration of your program must be in place before visa documents can be issued.

The completed financial certificate should outline financial support available to you. You should attach original evidence to support the amounts indicated (bank statements, scholarship letters, etc.). Please also attach a photocopy of the identification page of your passport.

The financial certificate is also required for international students currently residing in the United States. The University does not have special travel or study scholarships for international students.

We suggest that international applicants in need of financial aid write

to the Institute of International Education, 809 United Nations Plaza, New York, N.Y. 10017, or review the IIE Web site at www.iie.org.

The University's Office of Scholarships and Student Aid (studentaid.unc.edu) can only fund students who are U.S. citizens, nationals, permanent residents with I-151 or I-551 Alien Registration Receipt Cards, permanent residents of the Northern Mariana Islands and the Trust Territory or the Pacific Islands, and other noncitizens who have Arrival-Departure Records (I-94) showing "refugee" or "adjustment applicant" or official grant of asylum in the United States. Students who meet these requirements should apply for financial assistance before March 1.

Information concerning visa, U.S. Immigration or financial certificate matters can be obtained from our Office of International Student and Scholar Services (oisss.unc.edu). Please follow the mailing instructions above and do not mail admission materials directly to OISSS.

Decision Notification

Although individual programs may notify applicants of their recommendation regarding admission, official notification of the decision will come directly from The Graduate School. As a member of the Council of Graduate Schools, the UNC Graduate School has agreed to honor the April 15 deadline that applicants are given for responding to fall offers of admission. Every effort will be made to give sufficient notice regarding admission decisions prior to this deadline. Where an early decision is not possible, applicants can expect final notification regarding their application no less than two months before the beginning of the relevant semester.

Funding Opportunities

The Graduate School offers a variety of funding opportunities to assist graduate students in funding their graduate programs from admission through graduation. The Graduate School provides information and support to students applying for external fellowships, as well as providing fellowships and other direct financial support to graduate students, which supplements what the individual department provides.

Awards are made from The Graduate School, the various academic departments, the Office of Scholarships and Student Aid, and from external private and public sources. To receive full consideration for a Graduate School award, applicants should submit a complete application for admission by January 1. However, applications received after the January 1 deadline will be considered for fellowships as funds remain available. To receive financial assistance, students must continue to be enrolled, making satisfactory progress toward their degree.

University Competitive, Merit-Based Awards

A number of merit-based awards are available through The Graduate School. Prospective students cannot apply for these awards directly, but may indicate when applying that they wish to be considered for these awards. To ensure full consideration for these competitive awards, it is recommended that prospective students submit a complete application for admission by January 1. Departments, curricula and schools recommend a limited number of their most promising applicants into a University-wide competition. The Graduate School selects the top candidates to receive offers for University fellowships and merit assistantships. Announcements of Graduate School awards are made by early March. The following fellowships and assistantships are competitively administered by The Graduate School.

The Royster Society of Fellows

The Royster Society of Fellows is a highly competitive fellowship created through the generosity of private donors, most significantly Dr. Thomas and Mrs. Caroline Royster. In addition to the financial award, the Society of Fellows supports and nurtures members through the mentoring of senior faculty, interdisciplinary learning and leadership development opportunities.

Fellows will receive a competitive stipend, tuition, fees and student health insurance each year for five years. The first and last years are nonservice awards, but Fellows may perform teaching and research activities for their departments in the intervening years. Fellows receive additional travel funds to present research findings at national conferences. Fellows have the opportunity to develop mentoring relationships with senior faculty and to engage in interdisciplinary forums and discussions.

The Royster Society of Fellows includes dissertation completion awards named in honor of Caroline H. and Thomas S. Royster Jr., Thomas S. and Helen Borda Royster and Snowden and Elspeth Merck Henry, Lovick P. Corn, Henry H. Dearman, Jessie Ball duPont (Adolescent Studies), Paul C. Hardin, Lyle V. Jones, Ross and Charlotte Johnson, and others. These fellowships support students in the final phase of their doctoral dissertations. Fellows receive a competitive stipend for one academic year plus tuition, fees, student health insurance, and travel funds to present their research at national conferences.

University Fellowships

The Graduate School offers privately funded named fellowships to exceptional new graduate doctoral students. In addition to a very competitive financial award, a University Fellowship within the Society of Fellows supports and nurtures members through the mentoring of senior faculty, interdisciplinary learning and leadership development opportunities. These fellowships are named in honor of Joseph E. Pogue, William R. Kenan Jr., William N. Reynolds and Mrs. Victor Humphreys.

University Merit Assistantships

Merit assistantships are one-year awards that provide a competitive stipend for entering master's/doctoral students and students entering professional, terminal-degree master's programs. Full tuition and student health insurance are provided. Students pay only fees. Students awarded University merit assistantships will assist with teaching or research activities, not to exceed 20 hours per week, within their department.

Minority Doctoral Fellowships

The state of North Carolina offers the Minority Presence Fellowships as one mechanism to increase the diversity of the graduate student body engaged in doctoral study within the UNC system. Diversity is broadly defined, including consideration of 1) educational preparation, 2) life experiences, 3) factors that may contribute to diversity of presence, 4) demonstrated ability and motivation to overcome disadvantage or discrimination, 5) desire and ability to extend knowledge-based services to enhance the quality of life of all citizens, and 6) motivation and potential to make a positive contribution to the educational environment of the University. Recipients must be residents of North Carolina (for tuition purposes) and pursuing a doctoral degree. Awards provide a competitive stipend plus tuition and student health insurance.

Incentive Scholarship and Grant Program for Native Americans

The state of North Carolina offers a limited number of Native American Incentive Fellowships as one means of increasing the number of minori-

ties engaged in doctoral study within the UNC system. Recipients must be 1) Native Americans who maintain cultural identification as Native Americans through membership in an Indian tribe recognized by the state of North Carolina or by the federal government or through tribal affiliation or community recognition; 2) residents of North Carolina, and 3) students who are pursuing a doctoral degree. These nonservice awards provide a competitive stipend plus tuition and student health insurance.

Interdisciplinary Awards

Weiss Urban Livability Fellowships and Program

Endowed through a generous gift from Professors Emeriti Charles and Shirley Weiss, this program gives students with an interest in urban livability issues an opportunity for advanced study within an interdisciplinary program at the University of North Carolina at Chapel Hill. Recipients are designated as fellows within the Weiss Urban Livability Program. Doctoral and master's students receive a competitive stipend, tuition and health insurance. The Weiss Urban Livability Fellows meet regularly within an interdisciplinary forum to discuss and collaborate on topics of mutual interest. Guest lecturers and senior faculty from various departments meet with and provide mentoring for the fellows throughout the year.

Interdisciplinary Research Scholars Fellowship

This fellowship is designed to assist doctoral students in making rapid progress with their doctoral dissertations and to support students who would like to explore and pursue interdisciplinary research. The purpose of these fellowships is to give doctoral students an intensive period of time and experience to focus on completing their dissertation prospectus or research proposal. These fellowships are available to doctoral students who have completed most or all of their coursework and provide a competitive stipend, tuition, fees, and student health insurance for one academic semester.

Dissertation Support for Continuing Students

These nonservice awards support doctoral students engaged in research and writing toward the completion of their dissertations. The University Dissertation Completion Award supports students in the final phase of their doctoral dissertations. Awards provide a competitive stipend, tuition, fees and student health insurance for one academic year. The Off-Campus Dissertation Award assists students conducting research away from the Chapel Hill campus. Awards provide a competitive stipend, tuition, fees and student health insurance for one academic semester. A limited number of fellowships are also available for doctoral dissertation research in specific countries: the Werner P. Friedrich Fellowship in the Humanities for study in Switzerland and the Georges Lurcy Fellowship for study in France.

Departmental Awards

Teaching and Research Assistantships

The majority of assistantships available to graduate students at the University are awarded by academic departments. Approximately 2,500 graduate, research and teaching assistantships are available through specific departments. Graduate assistantships also are available through the University's various research institutes and centers. Selection criteria and application and notification procedures vary by department. Applicants should discuss with the program to which they are applying the specific funding opportunities available through that department.

Federal/State Fellowships and Traineeships

A number of state and federally funded fellowships and traineeships are available in some departments. Students must be pursuing graduate training in specified fields of study to be eligible for these awards. Interested students should request additional information from their academic departments.

Government and Foundation Fellowships to Individual Students

For many funding opportunities, students apply directly to a national private foundation or a government agency. Many of these competitive awards are portable; students may use the funds at any accredited university. Since recipients are chosen through competitions held by each individual funding agency or foundation, the criteria and processes for application vary.

Information about external funding opportunities is provided by the UNC-Chapel Hill GrantSource Library, which includes information from nearly 10,000 documents available from major funding sources. The University assists students in making application to external funding sources through workshops and individual consultations. Application materials for major funding competitions are usually available at www.gradschool.unc.edu/fellowships_and_funding/index.html or from The Graduate School Fellowship Office, located in 218 Bynum Hall, or at the GrantSource Library, 307 Bynum Hall.

Additional Current Funding Information

Additional and up-to-date information regarding funding opportunities for graduate students at the University of North Carolina at Chapel Hill may be found on the Web at www.gradschool.unc.edu/fellowships_and_funding/index.html.

Research Funds

The Smith Graduate Research Funds are provided by the University to assist with some expenses necessary for the preparation of a thesis or dissertation, such as database acquisition, microfilms, special software for analyzing data, and certain other expenses. Grants may be received only once and cannot be used for costs accrued prior to the date of an award. Research travel is not supported. A limited number of Graduate School travel grants, for travel expenses only, are available for doctoral and master's students presenting research papers at international, national or regional academic conferences or meetings of professional societies. Students may receive these grants only once. Information and application forms for these grants are available from The Graduate School, 218 Bynum Hall, or may be found on the Web at www.gradschool.unc.edu/fellowships_and_funding/index.html.

Financial Aid

The Office of Scholarships and Student Aid works with graduate students who need financial aid to meet the costs of attending the University. Financial support may be available through small grants, from federal or private lender loan programs and from the federal work-study program, in the form of either hourly paid campus jobs or teaching/research assistantships.

To be eligible for financial aid programs administered by the Office of Scholarships and Student Aid, a student must be enrolled in a degree program on at least a half-time basis, a United States citizen or perma-

nent resident, making satisfactory progress toward completion of the academic program, and, if applicable, registered for Selective Service. The student may not be in default on a loan previously received for college expenses nor owe a refund on a scholarship, grant or loan from a previous enrollment period.

Graduate students who wish to apply for financial aid to meet the costs of attending the University must complete the Free Application for Federal Student Aid (FAFSA). The application should be completed online at www.fafsa.ed.gov. However, a paper application may be obtained from high schools, most college financial aid offices or in person at the Office of Scholarships and Student Aid. In completing the FAFSA, the student must list UNC-Chapel Hill (code number 002974) as one of the schools to receive the FAFSA information. The information on the FAFSA will be analyzed by an agency contracted by the federal government. The agency will send information and an analysis of the student's eligibility for financial aid funds to both the student and to the Office of Scholarships and Student Aid.

A student should not wait for admission to a graduate program before applying for aid. An applicant should submit the FAFSA by February 15. If additional documentation is needed to complete a student's application for financial assistance, the Office of Scholarships and Student Aid will notify the student. A student who completes the file promptly can expect to receive notice of an award decision early in June.

Additional information about financial aid procedures and programs can be obtained from the Office of Scholarships and Student Aid, 300 Pettigrew Hall, P.O. Box 1080, Chapel Hill, N.C. 27514. The office is open from 8:00 a.m.–5:00 p.m. Monday–Friday. The telephone number is (919) 962-8396; telephone hours are 9:00 a.m.–4:00 p.m. Monday–Friday. More detailed information is also available at studentaid.unc.edu.

North Carolina Residency for Tuition Purposes

For Graduate School students only, go to gradschool.unc.edu/residency/index.html for residency requirements, guidelines, due dates and online application.

The Academic Common Market

The Academic Common Market (ACM) is a cooperative arrangement among universities in 16 states in the southeastern United States. To determine if you may be eligible to participate in the ACM and be charged tuition at the in-state rate, visit gradschool.unc.edu/admissions/common_mkt.html. Here you will see if your state participates, if your intended program of study is included in the ACM inventory, find deadlines and locate your ACM State Coordinator contact information.

Student Affairs Information

Students are at the center of the learning community at the University of North Carolina at Chapel Hill. To ensure a successful learning experience, graduate and professional students are encouraged to take advantage of a variety of programs and services offered by the University through the Division of Student Affairs, The Graduate School and individual schools and departments. Student Affairs oversees services intended for the entire University student community, and offers programs designed primarily for undergraduate students. The Graduate School, on its own and in conjunction with various Student Affairs offices, offers programs and services intended to specifically address the needs of graduate and professional students.

The Graduate School

The Graduate School is committed to improving and facilitating the integration of graduate and professional students' academic, professional and personal development, as well as to assist students to make the most of their Carolina experience. To further these aims, staff in The Graduate School are responsible for assisting students in a number of capacities. The offices of the associate dean for student affairs and the associate dean for academics create and implement programs and services that specifically address the needs of graduate and professional students. Some of these programs are listed below. The director of minority recruitment and retention develops and provides a number of programs and services throughout the year, both academic and social in nature, to assist graduate students of color with a successful transition and experience during their graduate work. The director of graduate student academic and professional development oversees workshops and events in the Graduate Student Center. Graduate School staff are available to all graduate and professional students as a source of counsel, information and referral for questions involving student services, academic procedures, policies and grievances.

Telephone: (919) 966-2611

Web: gradschool.unc.edu.

Graduate School Handbook

The *Graduate School Handbook* contains most of the policies and procedures of The Graduate School at the University of North Carolina at Chapel Hill. Students should become familiar with the material pertaining to their degree programs, and, together with their faculty advisors, make certain that the chosen program of study complies with all policies. The *Handbook* may be viewed or downloaded from the Graduate School Web site: handbook.unc.edu.

Policies and Guidelines for a Cooperative Learning Environment

Teaching and learning occur simultaneously through a partnership between instructor and student. Instructors share knowledge, experience and ideas with their students. Students process these thoughts, generate new ones and share them with their teachers. In most cases, students and instructors communicate clearly and effectively. However, misunderstandings do occur. In an attempt to foster a positive academic environment, the Faculty Council, upon recommendation of the Educational Policy Committee, establishes these policies and guidelines.

The Faculty Council resolves:

Part I. Policies

Section 1.

The Faculty Council recognizes and affirms the following policies. This recognition is not to be interpreted as precluding modification of any policy by the appropriate authority.

The Honor Code. The faculty should inform students of the provisions of the honor code and be aware of their own responsibilities specified in the honor code. Faculty responsibilities are stated in the Instrument of Student Judicial Governance.

Student Grievance Procedures. According to UNC-Chapel Hill Student Grievance Committee procedures, students may file a grievance against a UNC-Chapel Hill employee, EPA non-faculty employee, staff employee, or student employee (when acting in the role of employee) when there is a violation of one of the following:

A. The UNC-Chapel Hill Sexual Harassment Policy
B. The UNC-Chapel Hill Racial Harassment Policy
C. The UNC-Chapel Hill Policy on Sexual Orientation
D. The Americans with Disabilities Act
E. Title IX, which prohibits exclusion from participation on the basis of sex
F. Section 504 of the Rehabilitation Act of 1973, which outlaws discrimination on the basis of a handicap or
G. The Family Educational Rights and Privacy Act, which allows students to challenge the content of their educational records.

Copies of these can be obtained from the Office of the Dean of Students. They contain information about how to file a grievance. A grievance based on incidents that occurred more than six months before the complaint was filed will not be considered.

Student Access to Academic Records—Protection Against Improper Disclosure. As stated in The Family Educational Rights and Privacy Act of 1974, students may have access to their full academic records. Individuals who are, or have been, in attendance at UNC-Chapel Hill may inspect and review their education records. Otherwise, education records are subject to confidentiality requirements as specified by law and may not be disclosed improperly. Requests for recommendations imply that the student has given consent to the disclosure of information related to ability and performance. Judgments of ability and character may be provided under appropriate circumstances, normally with the knowledge or consent of the student. "Education records" are those records directly related to a student that are maintained by an educational institution. Particular University policy provisions are found in the University of North Carolina at Chapel Hill's Policies and Procedures under the Family Educational Rights and Privacy Act of 1974.

Appealing a Grade. The University has systems for appealing a grade. The exact procedures vary among the academic units. Students should consult with their dean or department chairperson to obtain information about grade appeal procedures.

Part II. Guidelines
Section 2.
The Faculty Council endorses the following guidelines for the faculty-student relationship. This endorsement shall not be construed as faculty legislation, is not intended to establish a contractual undertaking by the University or any individual, and shall not constitute the basis for civil action in a court or a claim in any administrative or judicial body of the University of North Carolina at Chapel Hill.

Clear Definition of Potential Honor Code Violations. In an attempt to avoid unintended misunderstanding, instructors should clearly state what is acceptable in their class. When study aids such as computers are allowed, the instructor is responsible for explaining what constitutes proper use of these items. These rules should be established at the beginning of the course and should not be changed without giving students proper notice.

Assignment of Graded Work During the Last Week of the Semester. Instructors may not assign graded work during the last week of classes unless the course syllabus clearly states that such an assignment will be given.

Suggested Classroom Procedures. In general, instructors are strongly encouraged to follow the guidelines for course design and classroom procedures recommended by the Center for Teaching and Learning. When students enter into a learning relationship, they have certain needs and expectations. They are entitled to information about course procedures, content and goals. Instructors should provide a syllabus that describes the course and methods of evaluation. Particular attention should be paid to several areas of special concern to students, including provision of reserve readings and grading policy.

Evaluated assignments should be returned to the students within a reasonable amount of time. Since part of the purpose of such assignments is to provide feedback, students should be given time to assess and to learn from their mistakes. Ideally, such assessment would take place while the relevant topics are still fresh in their minds.

Extra credit, if offered, should be announced publicly and made available to the entire class.

Students Should Have Freedom of Expression. Students should be free to take reasoned exception to the data or views offered in any course of study. They are responsible, however, for learning the content of any course of study for which they are enrolled. Incorrect facts and poorly supported arguments or opinions inevitably have an impact on grades. Nothing herein shall be construed to limit the freedom of the faculty to assign grades according to appropriate academic standards.

Responsibilities of Students and Teachers. Just as students ought to expect instructors who are knowledgeable and well prepared, so should teachers expect their students to be motivated, eager to learn and actively engaged in class. It is the responsibility of teachers to make their courses serious intellectual experiences for themselves and for their students. It is the responsibility of students to take seriously the courses in which they enroll. Good teachers need good learners.

Students should understand that they are members of a community of scholars, and membership in such a community is not a passive activity. To be full participants in the educational community and to maximize the educational value of a class, pre-class preparation is necessary. Proper class preparation involves obtaining course materials as they are needed and completing assignments as they are due. Full participation in a class requires regular attendance, arriving on time and remaining until class conclusion, and active involvement in the work of the class.

Students should also consider the extent of their own involvement in a class in assessing the educational value of a class.

Grade Appeals

The procedure for grade appeals can be found in the *Graduate School Handbook*. Any questions regarding the grade appeals process should be directed to The Graduate School.

Web: handbook.unc.edu/grading.html

Orientation

The Graduate School sponsors a University-wide orientation program for new graduate and professional students to (1) acclimate them to the University community and (2) to provide information sessions on a range of topics relevant to graduate students such as funding, residency for tuition purposes and getting to know the local area. Important reference materials and guides to the campus and Chapel Hill/Carrboro area community resources are available to students on the Graduate School Web site: gradschool.unc.edu. These resources include the *Graduate School Handbook*, *Academic Integrity and Ethics*, *A Guide to Theses and Dissertations*, copies of University policies and other helpful campus and community publications that are intended to be used throughout the students' graduate careers. As orientation is a continuous process throughout a student's first year, The Graduate School schedules a number of orientation workshops throughout the fall semester on a variety of issues related to graduate students.

In addition to the Graduate School orientation, individual graduate and professional programs conduct department-based orientations for new students. Information regarding departmental orientations is available in the respective academic departmental offices.

Orientation and relocation information can be found on the Web site of The Graduate School at gradschool.unc.edu. The Graduate School Office, open year-round, is located on the second floor of Bynum Hall. Graduate School staff and are available to answer questions and help students find the resources they need to make the most of their Carolina experience.

Professional Development in Graduate Education

The University of North Carolina at Chapel Hill is committed to providing students with the highest quality graduate education. While this clearly entails academic training, it also includes a commitment to providing students with resources and services to enhance their graduate experience and to prepare them for their post-student careers.

The cornerstone of professional development at Carolina is a series of workshops and selected one-credit-hour courses. These workshops cover topics designed to promote graduate student academic, professional and personal growth. Sessions are designed to provide students with the opportunity to develop five areas of professional competency: communication, leadership, teaching and instruction, professional adaptability and self-awareness.

For more information, visit the Web site of The Graduate School at: gradschool.unc.edu/student/profdev.

Graduate Student Foreign Language Proficiency Assessment

The departments of Romance Languages and Literatures, Germanic Languages and Classics offer foreign language proficiency assessments in

French, German, Spanish and Latin (classical or medieval) for graduate students needing to satisfy a departmental foreign language requirement. This service is offered once each semester. The Graduate School administers registration for these assessments.

Division of Student Affairs

Office of the Vice Chancellor for Student Affairs

The Office of the Vice Chancellor for Student Affairs coordinates the division's programs and provides guidance and leadership for its departments. The office also acts in a consulting role for faculty, administrators and students who wish to raise issues that concern the University community, with a particular focus on student needs. Members of the Office of the Vice Chancellor also serve on various University committees to represent the division's several constituencies.

Students are encouraged to explore the opportunities offered by the Division of Student Affairs throughout their University career, either directly through the respective departments, or through the Office of the Vice Chancellor.

Telephone: (919) 966-4045
Web: studentaffairs.unc.edu

Office of the Dean of Students

The Office of the Dean of Students, located in the basement of the Student and Academic Services Building, provides a variety of direct student services and works closely with a wide range of student programs. The Office of the Dean of Students is the contact and information point for students regarding the University's policies on racial and sexual harassment and discrimination based on sexual orientation. In addition, staff members provide counseling and general advisement to students and assist students, parents and members of the University staff in dealing with crisis situations or other problems affecting student life. Staff members of the Office of the Dean of Students also work with programs that have a specific focus, such as the Student Activity Fund Office (SAFO). In addition to providing the administrative coordination of the student judicial system, staff members also work with leaders of a variety of extracurricular organizations.

Telephone: (919) 966-4041
Web: deanofstudents.unc.edu

Campus Y

Since its founding in 1860, the Campus Y has been a starting point for the development of many programs responding to students' concerns. The mission of the Campus Y is the pursuit of social justice through the cultivation of pluralism. In particular, the Y serves as a bridge between the University and the local community by addressing the needs of both groups. Y-sponsored committees include community outreach (such as the Big Buddy, Elderly Exchange and Tutoring programs), social issues (such as Women's Issues and Human Rights Week), global action (such as Hunger Action and the South African Scholarship Fund) and fund-raising programs (such as the Footfalls Road Race). Students can also serve on the Y Student Executive Committee, for which elections are held in the spring. All students are welcome to visit the Campus Y offices in the new Student Union to learn about volunteer service and University, local and global issues.

Telephone: (919) 962-2333
Web: campus-y.unc.edu

University Career Services

Services for graduate students provided by University Career Services (UCS) include workshops on writing résumés and curriculum vitae, interviewing and job-seeking; résumé referral to employers; individual career advising and career interest assessment; on-campus interviewing; job listings via the Web; and a reference file for students in selected curricula. Some services are limited to students who are in a UNC-Chapel Hill degree or certificate program.

Additional resources and programs include occupational and employer information, career panels, career and professional school fairs, an automated alumni network service, various employer databases and a UCS home page on the Web.

Students in law, dentistry and medicine and students enrolled in the M.B.A. and M.A.C. programs are served by career services in their departments, rather than by UCS.

University Career Services is located in 219 Hanes Hall. Office hours are from 8:00 a.m. to 5:00 p.m. Monday through Friday. Resource Room hours are from 8:00 a.m. to 8:00 p.m. Monday through Thursday.

Telephone: (919) 962-6507
Web: careers.unc.edu

Counseling and Wellness Services

Counseling and Wellness Services (CWS), formerly Counseling and Psychological Services, provides free, confidential psychological counseling to help students solve personal, academic and career problems. CWS specializes in individual evaluations, counseling, psychotherapy and career counseling. A variety of counseling, testing, developmental and informational services are offered to all students. Counseling services for individuals or groups focus on academic success, including test anxiety and time management; career decisions, including selecting or changing a major and choosing a career; relationships, including loneliness, shyness, roommate conflicts, dating relationships and family problems; and cultural issues, including cultural identity, gay and lesbian issues, racism and women's issues. Also available are dissertation and thesis support groups; training and development programs; stress management and biofeedback; and communication skills training, including assertiveness training and guidance in how to overcome speech anxiety. CWS is located on the third floor of the James A. Taylor Building.

Telephone: (919) 966-3658
Web: caps.unc.edu

Disability Services

The Department of Disability Services is responsible for ensuring that programs and facilities are accessible to all members of the University community. Students with disabilities and/or medical conditions may receive accommodations and services that are designed to remove barriers, so that they may independently meet the demands of University life. Accommodations and services—which may include but are not limited to note-takers, alternative testing, accessible class materials and interpreters—are provided on an individual-needs basis. There is no charge for any accommodation or service. Students will be asked to provide documentation of the disability and/or medical condition from an appropriate primary care provider.

Telephone: (919) 962-8300 (Voice/TDD)
Web: disabilityservices.unc.edu

Academic Success Program for Students with LD and ADHD

The Academic Success Program for Students with LD and ADHD, formerly called Learning Disabilities Services, is the University's designated service provider to students with documented learning disabilities (LD) and attention-deficit/hyperactivity disorders (ADHD). The Academic Success Program also meets the needs of students with Acquired Brain Injury (ABI) in conjunction with the Department of Disability Services, the campus office that works with students with disabilities other than LD and ADHD.

Telephone: (919) 962-7227
Web: www.unc.edu/depts/lds

Housing and Residential Education

The Department of University Housing and Residential Education, consistent with the academic mission of the University, endeavors to provide eligible students a supportive environment within which to live. The department maintains the physical quality and the integrity of its buildings at a level conducive to security and comfort, and does so in the belief that providing a safe and healthy living environment supports and contributes to the learning process.

The University of North Carolina at Chapel Hill follows the principle that all persons shall have equal opportunity and access to facilities in any phase of University activity without regard to handicap, sex, race, creed, color, age, sexual orientation, or national origin. Under this principle, educational, cultural, social, housing, extracurricular and employment opportunities are available on an equal basis. However, receipt of the application by and advance payment to the Department of University Housing does not guarantee admission to the University or to a residence hall. The Department of University Housing reserves the right to refuse for just cause any application for space and to return any advance payment within two weeks of receipt of the completed application. Early application is encouraged.

Telephone: (800) UNC-5502 E-mail: housing@unc.edu
Web: housing.unc.edu

Graduate Student Housing

The Department of Housing recognizes that the living needs of graduate and professional students are usually different from those of undergraduates. At Carolina, graduate and professional students can enjoy the benefits of being affordably close to classes, facilities and events, and living in a community of fellow graduate students where the atmosphere is characterized by early quiet hours and respect for personal time and space.

Odum Village and Baity Hill Apartments are Carolina's on-campus community for graduate students providing apartment-style housing. Odum Village is located on south campus off of Manning Drive near the medical facilities, the Dean Smith Center and the Kenan-Flagler Business School. Its quiet yet friendly atmosphere lends itself to graduate student interests and study. The Baity Hill and Mason Farm communities serve as the Student Family Housing apartment complex for students with families. These one- and two-bedroom apartment communities are situated on rolling hills adjacent to the campus. The apartments are within walking distance of the campus and are served by campus and city bus routes. Rental costs compare favorably with similar area housing. These communities comprise nine buildings with 398 apartments.

Parking is available for graduate students on a limited basis, and a fare-free campus bus service offers several routes that connect the north, middle and south regions of campus. Find specifications for apartments by visiting the Housing Web site at housing.unc.edu and clicking on "Apartment Communities."

Generally, demand for on-campus housing for graduate students exceeds the supply. On-campus housing is not guaranteed for graduate students, although every effort is made to offer a space to all applicants. Returning residents have priority to re-sign up for the following academic year before spaces are offered to new graduate students. Please visit the department's Web site at housing.unc.edu for additional information.

Off-Campus Housing

Off-campus housing refers to any housing not owned and operated by the University of North Carolina at Chapel Hill. This category includes small group housing, such as fraternities and sororities, as well as apartments, houses and rooms. Two-thirds of the University's students live in the off-campus market. Some units are furnished and within walking distance to campus. Other off-campus housing consists of large, unfurnished apartment complexes located throughout Chapel Hill and Carrboro.

International Student and Scholar Services (OISSS)

The Office of International Student and Scholar Services promotes international educational exchange through its services and programs. OISSS serves as the principal administrative, programming and advising office for approximately 2,500 international students, faculty and administrative staff at UNC-Chapel Hill, including research scholars and visiting professors. Located in the FedEx Global Education Center, OISSS issues and helps maintain visa documentation, provides advising related to immigration matters and adjustment to life in the United States, and serves as a liaison between international students and scholars and their departments and governmental and private agencies involved in international education exchange. In addition to administrative and advising services, OISSS provides programming that helps international students and scholars maximize their experience at UNC-Chapel Hill. Programs include orientation, tax seminars and various cultural programs. The center is a focal point for community service organizations, including the Host Family Program, Conversation Partners Program, Speakers' Bureau and International Women's English Conversation Group. It also administers the UNC Class of '38 Summer Study Abroad Fellowships.

Campus Health Services

Campus Health Services (CHS), located next to Kenan Stadium in the James A. Taylor Building, provides a broad range of ambulatory, primary care and prevention services. Specialty care services are also available, including orthopedics, obstetrics and gynecology, dermatology, travel information and immunization, and allergy management. For convenience, in-house laboratory, radiology, pharmacy and physical therapy services are also available.

Any student who has paid the campus health fee for the current semester (or summer session) is eligible for health care at Campus Health Services. The fee covers the cost of most services provided by CHS professionals, including physicians, physician extenders, nurses, physical therapists and health educators. Additional charges are made for after-hours care, drugs and miscellaneous supplies. Laboratory and X-ray studies at CHS require a co-payment by the user. There also may be additional charges for specialty services. Spouses not enrolled in the

University as students become eligible to receive the same services as students by demonstrating appropriate insurance coverage and by paying the student health fee at CHS.

Hours of operation vary according to the academic calendar. Please call to verify hours of operation Monday through Friday and on the weekends. Preferred CHS office hours are 9:00 a.m. to 4:30 p.m., Monday through Friday, when students are seen on an appointment basis. For convenience, students are encouraged to call (919) 966-2281 for an appointment. After-hours care is available from 4:30 p.m. to 11 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. on weekends. Physician extenders are available with medical and psychiatric back up. Services are considered a premium service with a visit charge during these times. If other ancillary services are required an additional fee will apply. Major problems may be referred to the UNC Hospitals Emergency Department by the CHS staff when open, or by the HealthLink nurse (966-2281) when CHS is closed. Students should be aware that the campus health fee does not cover medical care at UNC Hospitals or other facilities. Students will be responsible for charges incurred at the UNC Hospital Emergency Department anytime that they use those services.

Because the health fee does not cover hospitalization, surgery and intensive care, it is strongly recommended that students have additional health insurance. The University has made arrangements with Blue Cross/Blue Shield of North Carolina to offer group health insurance coverage (including major medical benefits) to enrolled single and married students, their spouses and children. For information, contact Hill, Chesson and Woody Insurance Brokers, Post Office Box 3666, Chapel Hill, N.C. 27515, or access their Web site at www.hillchesson.com.

North Carolina law mandates that all new students at the University document the completion of immunization requirements. Failure to comply results in cancellation of registration thirty days after classes begin. Vaccines are offered at Campus Health Services at reduced rates for students who need to complete their immunization requirement. For additional information on Campus Health Services, visit the CHS Web site at studenthealth.unc.edu.

Carolina Union

The Carolina Union is an organization of students, professional staff and part-time student staff who provide programs, services and facilities for all members of the campus community. The Carolina Union contributes to the educational mission of the institution through the provision of cultural, social, educational and entertainment programs sponsored by the Carolina Union Activities Board and the Carolina Union Performing Arts Series. The many co-curricular programs offered impact the intellectual environment of the campus and create opportunities for campus members to engage in debate, conversation and interaction around the issues of the time.

Students play an important role in determining needs, setting programming and financing goals and evaluating all aspects of the Union. Student employees also provide and maintain the many services offered in the Frank Porter Graham Student Union and other campus locations.

The Carolina Union Board of Directors reviews and approves Union finances, provides long-range planning for the Union and selects the Union president from student volunteers each year. The Carolina Union Activities Board is a student organization that plans and carries out social, cultural, recreational and educational programs for the entire student body. Programs range from informal stage performances and workshops on current issues to major speakers and popular and cultural concerts.

In addition to providing office and meeting space and services for student organizations, the Carolina Union also offers lounge space, food services, bowling, billiards and games for all UNC-Chapel Hill students.

Employment opportunities are available in many of the Union's service areas, such as the information desk, ticket office and technical services. (For more information, contact the administrative office in Room 201 of the Frank Porter Graham Student Union.)

More information about the Carolina Union is available on the Web at www.unc.edu/depts/union/union.htm.

Cocurricular Student Organizations

The University requires that cocurricular student organizations be officially recognized each academic year. This recognition process is designed to ensure that student organizations affiliated with the University do not discriminate on the basis of race, religion, national origin, disability, age, veteran status, sex (as defined by law), or sexual orientation. In addition, official recognition provides student groups with the following benefits: applying for use (through reservation) of specified University facilities, property, services, or equipment pursuant to the Facilities Use Policy; use of the University's name in the organization's title, so long as University sponsorship or endorsement is not implied or stated; the privilege of applying for funding from monies generated by the Student Activity Fee, which is legislatively apportioned by the Student Congress; and the assistance of University staff. Applications for official University recognition must be completed annually, in order to ensure that active students are aware of University policies and to provide staff with information concerning University-recognized student organizations.

Applications are available in Room 201 of the Frank Porter Graham Student Union Building. *(Note: all information in and attached to the application is considered public information upon the granting of recognition.)*

A full list of active student organizations (there are currently more than 600) is available on the Web at cf.unc.edu/dsa/union/studorgs.

Student Government

The Graduate and Professional Student Federation (GPSF), the official representative of graduate and professional students at the University, is organized on the basis of school, departmental and curricula organizations. The GPSF provides communication between graduate and professional students, represents graduate and professional students both within and outside the University community, and provides structures capable of dealing with ongoing issues and concerns. It also allocates and administers the funds appropriated to it from student fees. Every duly enrolled graduate and professional student is automatically a member of the GPSF. Web: gpsf-wiki.unc.edu/confluence/display/gpsfHome/Home.

Graduate students, whether as a result of individual interest or because of teaching assistantships, may want to learn more about student government at Carolina. Information is available on the Web at studentorgs.unc.edu/studgov.

I. Executive Branch of Student Government

A. *Officers:* President; Vice President; Treasurer; Secretary; Executive Assistants; Elections Board Chair

B. *Current committees that address various areas of student concern:* Academic Affairs; External Relations; Human Relations; Info-Tech; Public Service; Student Services

II. Judicial Branch of Student Government

Student Courts (both Undergraduate and Graduate). These bodies maintain original jurisdiction with respect to all violations of the Code of Student Conduct.

Student Attorney General's Staff. The staff of the Student Attorney General investigates alleged violations of the Code of Student Conduct and brings to trial those charges sufficiently supported by evidence. The staff also advises and assists students accused of violations.

University Hearing Board. This court has original jurisdiction in cases deemed inappropriate for hearing within another court, and appellate jurisdiction with respect to cases appealed from student courts.

III. Legislative Branch of Student Government

Student Congress. The legislative branch of the student government is unicameral (one house), consisting of thirty-seven representatives elected by the student body, with the presidents of the student body and of the Graduate and Professional Student Federation (GPSF) serving as non-voting ex officio members. The Speaker of the Student Congress (SC) is elected from among the representatives. Graduate and professional students and on- and off-campus undergraduates are proportionally represented in the congress. Graduate and professional students represent districts composed of several schools grouped together, while undergraduates represent geographical areas.

The Student Congress handles a vast amount of legislation; one of its primary responsibilities is to appropriate student fees for recognized student organizations. Congress also approves appointments, serves as a student advocate and legislates changes to the Student Code.

The representatives are elected in the spring for one-year terms, and each member serves on one of three standing committees: Finance, Rules and Judiciary, and Student Affairs.

Other Services

Public Safety

The Office of Public Safety is located on Manning Drive on the UNC-Chapel Hill campus. Public safety administers the parking and transportation system at the University (including the issuing of parking permits) and provides for the overall safety and security of the campus. Parking permits are available for purchase on a limited basis for students. More information about parking availability can be found on the Web at www.dps.unc.edu.

The University publishes an annual public safety report of activities requiring intervention by campus security. This report also includes campus security policy and procedures. The annual public safety report may be obtained by contacting the office of the University Counsel at (919) 962-3031, or may be viewed on the Web at www.dps.unc.edu/dps.

Student Dining Services

Carolina Dining Services operates ten separate dining facilities at UNC-Chapel Hill. Meal purchases can be made with the UNC One Card using a meal plan, Dining Flex, à la carte, expense or cash. All meal purchases made with the UNC One Card are not subject to the six percent North Carolina state sales tax on these items. Cash purchases are taxable. To find out more information about acquiring a UNC One Card, visit the One Card Office Web site at www.onecard.unc.edu.

Students can use their meal plans at several of the campus all-you-care-to-eat dining facilities. Top of Lenoir is an award-winning facility with an array of menu choices. The new Rams Head Dining Hall is a 30,000 square foot state-of-the-art facility that includes several restaurants and all-you-care-to-eat venues.

Carolina Dining Services offers several meal plans that offer the convenience and value of purchasing meals on campus ahead of time. To find out more about the different meal plan options, visit the Carolina Dining Services Web site at www.dining.unc.edu

Sonja Haynes Stone Center for Black Culture and History

The Sonja Haynes Stone Center for Black Culture and History (SHSCBCH) was founded in July 1988 and is named for Dr. Sonja Haynes Stone, a member of the UNC-Chapel Hill family for more than 17 years. The SHSCBCH opened in a new building on South Road in fall 2004 in the heart of campus, across from the Student Union and near the Bell Tower. As a center within the University's Academic Affairs Division, SHSCBCH has a central role in supporting the University's academic mission by a strong commitment to broaden the range of intellectual discourse about African Americans and to encourage better understanding of peoples of the African diaspora and their perspectives on important social and cultural issues. The center focuses its efforts on the interdisciplinary examination of Africana lives, cultures and histories. The Stone Center works with numerous departments and units of the University to help promote interdisciplinary inquiry, as well as focused examinations from various interdisciplinary and disciplinary perspectives.

The Stone Center is a major resource of cultural, historical and social programming for the UNC-Chapel Hill community. As a focal point for Black cultural expression, the Stone Center sponsors concerts, poetry readings, lectures, group discussions and presentations in drama and dance. Its permanent programs include the Sonja Haynes Stone Memorial Fellowship and Lecture, the African Diaspora Lecture Series, the Cross-Cultural Communications Institute (CCCI), and the Sonja Haynes Stone Collegiums, and the Visiting Scholar Program. More information about the Stone Center can be found on the Web at sonjahaynesstonectr.unc.edu.

Academic Resources

Scholarly Journals

The University has published scholarly journals since 1884, when the *Journal of the Elisha Mitchell Scientific Society* first appeared.

The following list contains some of the publications currently produced by the University's graduate and professional programs.

American Diplomacy. A journal for commentary, analysis and research on American foreign policy and its practice. www.unc.edu/depts/diplomat

Annali d'Italianistica. The mission of this publication is to promote the study of Italian literature in its cultural context, to foster scholarly excellence and to select topics of interest to a large number of Italianists. www.ibiblio.org/annali

Carolina Papers in International Health and Development. A series of UNC-Chapel Hill graduate student working papers designed to promote scholarship in the fields of health and development and to raise awareness of such issues among international studies specialists. gi.unc.edu/research/carolina-papers/index.html

Endeavors. Features outstanding research and creative work undertaken by faculty and students at the University. Distributed free, the magazine reaches 8,600 on- and off-campus readers in an effort to engage others in Carolina research. www.research.unc.edu/endeavors

North Carolina Law Review. Published by the School of Law to stimulate research and publication by faculty and students. studentorgs.law.unc.edu/nclrev/default.aspx

S*tudies in Romance Languages and Literatures*. For 60 years, this publication has supported and disseminated scholarship in the romance literatures. www.unc.edu/~clsherma

The University of North Carolina Studies in the Germanic Languages and Literatures. An internationally renowned monograph series in the field of Germanic studies. www.unc.edu/depts/german/graduatestudiesopportunities/paperseries.html

In addition, the University of North Carolina Press publishes the following journals (uncpress.unc.edu/bm-journals.html):

Social Forces, one of the best known journals in sociology and related fields.

The High School Journal, for educational practitioners and theorists nationwide.

Studies in Philology, publishing articles on British literature before 1900 and articles on relations between British literature and works in the classical, Romance and Germanic languages.

Southeastern Geographer, published the academic work of geographers and other social and physical scientists since 1961.

Southern Literary Journal, premier publication devoted to the fiction, poetry and drama of the American South.

Southern Cultures, dedicated to the exploration of what makes the South the South.

Early American Literature, journal of the Division on American Literature to 1800 of the Modern Language Association.

Appalachian Heritage, a leading literary magazine of the southern Appalachian region.

The University of North Carolina Press

The University of North Carolina Press is the primary publishing arm of the University in the scholarly field. In addition to its publication of the journals of research, it carries on a book publishing program of about 80 new titles a year. Although these books are the work of scholars from all parts of the world, the presence in the University of a professionally staffed book publishing organization, with facilities for the international distribution of works of scholarship, is a stimulus to research and writing by members of the University community. The Press' program is an important contribution to the development of that aspect of the University's service which has to do with the advancement of learning.

Web: uncpress.unc.edu/default.htm

Electronic Publications: www.ibiblio.org/uncpress/epubs.shtml

Libraries

The University Libraries

The main humanities and social sciences collections of the Academic Affairs Library are housed in the Walter Royal Davis Library. Davis Library includes more than 900 open and closed carrels for assignment to graduate students, and an additional 1,950 lounge, carrel and table seats for general use. The building also houses group study rooms, 11 lounges, a computer lab and a number of special study areas. All students are also welcome to use the Louis Round Wilson Library, home of the University's special collections, as well as the Robert B. House Undergraduate Library and any of the specialized departmental libraries.

The University Libraries hold over five million bound volumes and nearly 4.5 million microforms, constituting one of the most important collections in the South. Additional information about the libraries, as well as access to the online catalogs and to many electronic resources, is available at www.lib.unc.edu. Reference librarians at any of the UNC-Chapel Hill libraries are available to help graduate students locate materials, use print or online library resources or tackle any question from the most basic to in-depth advice on research projects.

The University Libraries receive more than 100,000 periodicals and other serials annually, including the publications of professional associations and learned societies. The Academic Affairs Library also receives the publications of such organizations as the Smithsonian and Carnegie institutions, the Rockefeller Foundation, the Hispanic Society of America, and the Russell Sage Foundation, and of many universities, including foreign universities and academies.

The government document collections comprise a rich body of resources. The Academic Affairs Library is a regional depository for United States government documents and United Nations publications, as well as selected foreign government documents. Particularly rich are its files of federal and state publications; state legislative journals,

laws, collected documents, colonial and state records; and records of constitutional conventions.

The libraries provide access to a wide array of online resources including indexes and abstracts, statistical materials and government data, and full text titles. Many titles may be accessed from home by members of the University community. The Davis Library Information Commons makes available state-of-the-art workstations for library research.

Departmental libraries containing collections for study and research are assigned to Art, Biology (Botany and Zoology), Chemistry, City and Regional Planning, Geological Sciences, Institute of Government, Information and Library Science, Mathematics/Physics and Music. The Law Library, containing more than 300,000 volumes, is located within the School of Law at Van Hecke-Wettach Hall. It contains material useful to students of history and government.

In addition to the collections available in-house, the libraries provide access to a multitude of external resources. Materials that the libraries do not own may be borrowed through interlibrary borrowing. UNC-Chapel Hill students may obtain a Triangle Research Libraries Network card allowing them to borrow materials from Duke, North Carolina State and North Carolina Central Universities. The valuable manuscripts of the State Department of Archives and History and the collections of the State Library at Raleigh are also nearby.

Web: www.lib.unc.edu

Special Collections (Wilson Library)

The North Carolina Collection holds books, pamphlets, maps, newspapers, serials, broadsides, microforms, documents, recordings and other materials relating to the state and its people, and ranging in date from the 16th century to the present. Two of its prominent collections are the Sir Walter Raleigh Collection, relating to the courtier and the era of Elizabethan exploration, and the Thomas Wolfe Collection of manuscripts and published items by and about the University's well-known literary alumnus. The Photographic Archives provide a visual record of people, places and events throughout the state in negatives, prints and postcards, including examples of all formats beginning with daguerreotype of the 1840s. The North Carolina Collection Gallery exhibits artifacts, art and furnishings related to the history and culture of the state and the University.

The Manuscripts Department consists of several units. The Southern Historical Collection preserves private papers—letters, diaries, account books, broadsides, photographs, taped interviews, video documentation, etc.—of individuals, families and organizations of the region. University Archives houses the official unpublished records of the University created since its charter in 1789. The General and Literary Manuscripts Collection includes documents related to notable British writers and literary enterprises and to American writers from outside the South. The Southern Folklife Collection houses extensive recorded music, field tapes, photographs, movie film and other materials related to study and research in the field of folklore and popular culture, with emphasis on materials about the region.

The Rare Book Collection includes books, pamphlets, broadsides, medieval and Renaissance manuscripts, and graphic images. Of particular interest are the Estienne Imprint Collection, the Bernard J. Flatow Collection of the Cronistas, the George Harper Collection of W. B. Yeats, the Archibald Henderson Collection of George Bernard Shaw, the William Henry Hoyt Collection of French History, the Bill Morgan Collection of Beat Literature, the William A. Whitaker Collection of Samuel Johnson and His Circle, and an array of collections supporting the study of 19th-century British, Irish and American literature.

Health Sciences Library

The Health Sciences Library is the primary library for the University of North Carolina Schools of Dentistry, Medicine, Nursing, Pharmacy and Public Health, and the University of North Carolina Hospitals. It also serves the health and biomedical information needs of the entire University of North Carolina at Chapel Hill, the North Carolina Area Health Education Centers (AHEC) system, and health personnel and researchers throughout the state.

Collections

The library has an excellent collection to support curricular, research and patient care information needs, consisting of more than 300,000 volumes and more than 4,000 serial titles, and over 3,000 electronic resources. The Health Sciences Library provides a growing collection of computer-based multimedia courseware, CD-ROMs and customized computer-assisted instruction, and offers electronic reserves. Information about the collection is accessible through the Triangle Research Libraries Network online catalog (www.trln.org). UNC-affiliated users have free access to the majority of the library's collections, wherever and whenever they are needed.

Borrowing

Faculty, students, researchers and staff of the University of North Carolina at Chapel Hill and the University of North Carolina Hospitals, as well as area health professionals, receive borrowing privileges upon application. The library provides photocopy services, article delivery service and an interlibrary loan service for materials not available on campus. Borrowing privileges are also available to any North Carolina resident for a small fee.

Information Services

Librarians are available to aid users in locating information, to instruct in the use of library resources and to provide additional help. Online search services, with access to MEDLINE and about 100 other databases, are also provided. Direct access to databases and full text journals is offered through the library Web site (www.hsl.unc.edu) free of charge. From this site, users can search MEDLINE, nursing and allied health literature, international pharmaceutical abstracts, public health community papers and other databases from their workstations on and off-campus. These and other databases are also available in the library.

The Health Sciences Library coordinates the AHEC Library and Information Services Network. This is a statewide network that supports information services for community-based health professions education. Students, faculty off-campus and preceptors receive a variety of help through the Information Connection Service.

Help in using the library's services and collections is available online, via e-mail, by telephone and by appointment. Consultation services can be used to make an appointment with a library staff member to develop a search strategy for a thesis topic, to learn advanced literature search techniques or to receive any other in-depth help needed. In addition, education services faculty offer a variety of instructional programs, including orientation, workshops and course lectures, designed to teach information-management skills.

Information Technology Services

UNC-Chapel Hill's campus computing services are organized under a central office: Information Technology Services (ITS). Most graduate students have their main contact with ITS through divisions that manage academic computing, electronic mail (e-mail), public microcomputing labs, interactive media presentation, database access, exam scoring, networking, and video and multimedia classroom support. The IT Response Center (ITRC), Carolina's help desk, assists students, staff and faculty in using IT services across campus. Visit the online help site at help.unc.edu for self-help options or to contact the ITRC, or call (919) 962-HELP for assistance.

All enrolled students at UNC-Chapel Hill are eligible for a login ID, called an Onyen (Only Name You'll Ever Need), that can be used for e-mail and other IT services at UNC. After creating an Onyen at onyen.unc.edu, students are able to create personal Web pages, download shareware software, check grades and set up their computers to access the campus wired or wireless network.

With the Onyen, a number of online services are available, including e-mail, listservs, access to online courses in BlackBoard and access to MyUNC, Carolina's portal (my.unc.edu). Through the portal, students can access their class lists, grades, financial information and other relevant sites, all with a single login.

Off-campus students may want to consider subscribing to an Internet service provider (ISP) or learn about other ways to remotely access the University networks. Detailed information can be found on the help site at help.unc.edu.

Public microcomputer labs can be found throughout campus. Each lab has Microsoft Windows machines as well a variety of software applications for student use. Additionally, all lab machines have Internet connections, so students can check their e-mail or access the Web. There are also laser printers for student use in each lab. Lab hours vary according to usage patterns and location; check the help site at help.unc.edu for information on lab locations and hours of operation.

Web: its.unc.edu

Research Resources

The intellectual life of the University and the research activities of graduate students and faculty alike receive valuable encouragement and support from the various institutes and centers listed below. These institutes do not operate as instructional agencies within the University; rather, they serve to obtain financial and organizational assistance for the scholars who constitute their membership. Many of the institutes provide opportunities for graduate student training.

Research Institutes and Centers

Most research centers and institutes can be found at the following Web site. Selected locations are detailed below.
research.unc.edu/services/offices.php

Child Development Institute

(see Frank Porter Graham Child Development Institute)
www.fpg.unc.edu

Institute for the Arts and Humanities

The institute's mission is to provide time and common space for faculty in the College of Arts and Sciences to work on projects that will advance their careers and benefit their students. The institute provides funds for faculty during the academic year or summer (Faculty Fellows Program) so that faculty may spend their time on scholarly or research activities.
(919) 962-0249
www.iah.unc.edu

Institute for the Environment

The UNC Institute for the Environment is leading UNC's world-renowned environmental community in developing solutions to critical environmental challenges. In doing so, it educates future environmental leaders and engages with the people of North Carolina and the nation to address and solve environmental challenges.
www.ie.unc.edu/index.cfm

Institute for Research in Social Science

(see Odum Institute for Research in Social Science)
www.odum.unc.edu

Institute of African American Research

The Institute of African American Research (IAAR) is the research component of the Sonja Haynes Stone Center for Black Culture and History. The mission of the institute is to promote the scholarly investigation of the culture and thought of African Americans, as well as Blacks in the Diaspora. The aim of the institute is to support intellectual productivity across far-reaching investigative interests and academic disciplines that is committed to research in Black studies. The institute supports projects that examine the impact of the African Diaspora on Black life and culture in the United States.
www.unc.edu/iaar

Institute of Government

The Institute of Government within the School of Government is devoted to teaching, research and consultation in state and local government. Over the years the institute has served as the research agency for numerous study commissions of the state and local government.
(919) 966-5381
ncinfo.iog.unc.edu

Institute of Latin American Studies

The Institute of Latin American Studies (ILAS) was created in 1940. The major functions of the institute are: (1) to encourage and stimulate study and research on Latin America at UNC-Chapel Hill; (2) to serve as a campus hub for interdisciplinary communication on Latin America, including the sponsorship of a wide variety of activities that bring together interested faculty and students from a large number of academic disciplines; and (3) to promote the exchange of scholars and students and to encourage close collaborative relationships between the University and institutions of higher learning in Latin America and the Iberian Peninsula.
(919) 966-1484
ilas.unc.edu

Institute of Marine Sciences

The institute's mission is to serve the state and nation through the conduct of high quality basic and applied marine science research.
(252) 726-6841
www.marine.unc.edu

Institute of Outdoor Drama

Established in 1863, the Institute of Outdoor Drama is a public service agency of UNC-Chapel Hill. It is the only advisory and research organization in the United States dedicated to the advancement of the outdoor drama movement, and serves as a resource for groups, government agencies and individuals who wish to create new outdoor dramas or who are seeking information on the field.
(919) 962-1328
www.unc.edu/depts/outdoor

Institute on Aging

Mission: The North Carolina General Assembly created the Institute on Aging in August 1996, placed it under the general umbrella of the 16-campus University of North Carolina System and based it at the UNC-Chapel Hill campus. The institute's mission is to enhance the well-being of older people in North Carolina by fostering state-wide collaboration in research education and service. Its mandate is to: 1) Promote collaborative applied and basic gerontological research; 2) Develop innovative programs of interdisciplinary gerontological education and practice; 3) Provide state-of-the-art information to policy makers, program managers, service providers, clinicians and the general public.
www.aging.unc.edu

Jordan Institute for Families

Created in 1996, the Jordan Institute for Families is the research, training and technical assistance arm of the School of Social Work at The University of North Carolina. Cutting across traditional disciplinary lines, the Jordan Institute develops knowledge and promotes practices and policies that build supportive families and stable communities. The Jordan Institute addresses family issues across the life span that threaten to undermine some families—such as poverty, abuse, mental illness, school failure and substance abuse—as well as challenges that confront most families, such as providing for aging family members and caring for young children.

ssw.unc.edu/jif

Kenan Institute of Private Enterprise

The Frank Hawkins Kenan Institute of Private Enterprise, an affiliate of the Kenan-Flagler Business School, encourages cooperation among business, academia and government to foster private-sector development and to utilize the private sector to serve the public interest in the United States and worldwide. The Kenan Institute develops innovative public-private and private-private partnerships that build the capacity of people, business and communities to prosper in market-based environments. These programs are anchored in research that provides the basis for replicating and extending these outreach programs nationally and internationally. The Kenan Institute was established in 1985 by a series of gifts from the William R. Kenan Jr. Charitable Trust and the William R. Kenan Jr. Fund. The institute operates from two locations—the Kenan Center at the University of North Carolina at Chapel Hill and Washington, DC. A sister institute in Thailand, Kenan Institute Asia, has been established to provide a physical and institutional presence.

www.kenan-flagler.unc.edu/KI

H. W. Odum Institute for Research in Social Science

H. W. Odum Institute for Research in Social Science promotes and supports social science research at UNC-Chapel Hill. Founded in 1924, the Odum Institute houses one of the nation,s largest social science and census data archives, maintains a state-of-the-art computing and GIS lab for faculty and student research, offers advanced quantitative and qualitative statistical software and consulting support for social science and survey research design and analysis, offers short courses and seminars on research topics and sponsors 16 ongoing faculty work groups.

www.odum.unc.edu

Oak Ridge Institute for Science and Education

Since 1946, students and faculty of the University of North Carolina have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 85 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at see.orau.org.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

www.orau.org

Triangle Institute for Security Studies

The object of TISS is to promote communication and cooperation among faculty, graduate students and the public across disciplines and beyond the confines of each university in order to advance research and education concerning national and international security, broadly defined.

(919) 684-5162

www.pubpol.duke.edu/centers/tiss

Bowles Center for Alcohol Studies

The mission of the Bowles Center for Alcohol Studies is to conduct, coordinate and promote basic and clinical research on the causes, prevention and treatment of alcoholism and alcohol abuse.

(919) 966-5678

www.med.unc.edu/alcohol

Carolina Center for Public Service

Mission: The Carolina Center for Public Service leads the University,s engagement efforts and service to the state of North Carolina and beyond by linking the expertise and energy of faculty, staff and students to the needs of the people.

In all its efforts, the Carolina Center for Public Service seeks to build partnerships throughout the University and the state as it:

- advances the quality and sustainability of efforts through effective practices
- recognizes and celebrates exemplary service
- shares information, strategies and outcomes of UNC's service endeavors
- facilitates community-based scholarship in addressing community issues

As the first public university, Carolina has a proud history of changing lives through educating scholars and leaders dedicated to forging a brighter future for the state, nation and the world. The University of North Carolina at Chapel Hill is committed to expanding its tradition of engagement and responsiveness through the Carolina Center for Public Service.

www.unc.edu/cps

Carolina Population Center

The Carolina Population Center exists to serve the research and research training needs of faculty at The University of North Carolina at Chapel Hill who have interests in the population field. The center is rich in its

diversity. Its 56 faculty fellows have their primary appointments in 16 departments in five schools or colleges within the University. The postdoctoral, predoctoral and undergraduate training programs also reflect the diversity of the center.

(919) 966-2157
www.cpc.unc.edu

Cecil G. Sheps Center for Health Services Research

The Cecil G. Sheps Center for Health Services Research organizes interdisciplinary research on the structure and impact of the health care system. A fundamental interest of the center has been the interaction between the medical care system and vulnerable populations, such as the poor, the elderly, rural residents, minority groups, the chronically ill, children and the mentally ill.

(919) 966-5011
www.shepscenter.unc.edu

Center for Aging Research and Educational Services

The Center for Aging Research and Educational Services is dedicated to serving social work practitioners and decision makers who work with older adults and their families.

ssw.unc.edu/cares/cares.htm

Center for AIDS Research

The purpose of the UNC Center for Aids Research (CFAR) is to provide infrastructure to support investigation of the HIV/AIDS epidemic using clinical research, behavioral research, research into HIV biology and pathogenesis at the molecular level, and educational outreach. The UNC CFAR is a consortium of three complementary institutions: The University of North Carolina at Chapel Hill, Research Triangle Institute and Family Health International.

www.cfar.unc.edu

Center for Community Capitalism

The center examines ways that government, nonprofits and the private sector can work together through innovative public-private community development partnerships to strengthen inner cities. The center works to create public policies that will make capitalism work better in distressed communities and focuses on new ways government policy can bring the energy of private enterprise to lift inner-city residents out of poverty. It views inner cities as untapped markets with considerable financial and human resources and profit potential for enterprising businesses.

www.ccc.unc.edu

Center for Developmental Science

The Center for Developmental Science is an interdisciplinary and interinstitutional center for the advanced study of human development. The mission of the CDS is to provide an environment that transcends the ordinary boundaries of disciplines and institutions in order to facilitate multidisciplinary, collaborative explorations of new frontiers in developmental research and training based on the principles of developmental science.

Goals of the CDS are:

- to transcend traditional barriers to scholarship by drawing developmental investigators from a wide variety of disciplines and institutional affiliations
- to support research about human development that aims to understand the basic processes of behavioral, emotional, physical and cognitive development, and the mechanisms that affect development across the life span
- to develop, apply, critique and revise developmental theory and methods such as longitudinal design and data analytic techniques that are sensitive to developmental processes
- to translate this basic science research into practice in a variety of venues in order to improve the health and developmental outcomes of individuals across the life span
- to develop and support a strong cohort of developmental researchers through the establishment of a unified and integrated research environment in which faculty collaborate and work closely with each other and with doctoral students and postdoctoral fellows to prepare the next generation of developmental researchers.

Funded by grants from the National Institute of Health and other sources, the CDS administers a pre- and postdoctoral training program, sponsors a weekly consortium series, supports workshops and special institutes on critical topics, and provides support for visiting faculty.

(919) 962-0333
www.cds.unc.edu

NSF Science and Technology Center for Environmentally Responsible Solvents and Processes

More than 30 billion pounds of organic and halogenated solvents are used worldwide each year as process aids, cleaning agents and dispersants. Considerably more water is used and contaminated in related processes. In the 21st century, manufacturing and service industries must increasingly attempt to avoid production, use and subsequent release into the environment of contaminated water, volatile organic solvents, chlorofluorocarbons and other noxious pollutants. Technological breakthroughs of the last decade now indicate that liquid and supercritical carbon dioxide (CO2) could become a very commonly used solvent in overcoming these environmental problems. The S&T Center for Environmentally Responsible Solvents and Processes, established in 1999, has as its goal to develop the scientific fundamentals necessary to enable liquid and supercritical CO2 to replace aqueous and organic solvents in key processes in the nation's manufacturing sector. Three key focus areas identified to date are macromolecular synthesis/engineering, microlithography and nanostructures. This is a multidisciplinary effort with participants from five academic centers and two national laboratories: the University of North Carolina at Chapel Hill, North Carolina State University, North Carolina A&T University, University of Texas at Austin and Georgia Institute of Technology in partnership with Sandia National Laboratory and Oak Ridge National Laboratory.

(919) 962-5468
www.nsfstc.unc.edu

Center for European Studies

The mission of the Center for European Studies is to advance understanding of the social, political and economic events that shape contemporary Europe. It does this primarily by supporting faculty and graduate student research through its roles as a National Resource Center funded by Title VI grants and as a European Union Center funded by the European Commission. At the same time, the center disseminates knowledge about contemporary Europe by enriching the University,s work in graduate and undergraduate education and in outreach programs with public schools. One major new initiative in the center's educational functions has been the establishment of the

Trans-Atlantic Master's Program (TAM). Another is its present effort to institute a new major in contemporary European studies.

www.unc.edu/depts/europe

Center for Gastrointestinal Biology and Disease

The Center for Gastrointestinal Biology and Disease promotes research and teaching on all aspects of gastrointestinal biology, physiology and epidemiology, with special emphasis on inflammatory bowel disease. Resources at the center's disposal include investigators and core laboratories at two constituent members of North Carolina's university system. The University of North Carolina at Chapel Hill, where the activities are based largely at the School of Medicine, and North Carolina State University, where the activities are based largely at the School of Veterinary Medicine. The level of cooperation between these different but complementary institutions makes the center unique.

(919) 966-1757

giadmin.med.unc.edu/cgibd

Center for Health Statistics Research

The Center for Health Statistics Research (CHSR) opened its doors in the fall of 1999 with the mission of providing the infrastructure and relevant expertise to address important statistical design and analysis issues tied to research focusing on high-risk populations, especially that which leads to new insights in health promotion and disease preventions. This is accomplished by 1) focusing the center's attention on methodological issues that arise in conjunction with existing substantive research efforts and 2) conducting this statistical research parallel to and in collaboration with the efforts of researchers in various settings of the health research landscape in North Carolina.

(919) 962-3282

www2.sph.unc.edu/chsr

Center for Home Visiting

The center's mission addresses the following goals through collaborative efforts with researchers, educators, evaluators, trainers, practitioners and policy makers: to promote interdisciplinary research and evaluation efforts, to promote interdisciplinary training efforts at the college and university level, to promote interdisciplinary efforts in ongoing professional activities and to advance the knowledge base concerning practice and training.

(919) 962-9197

www.unc.edu/~uncchv

Center for Instructional Technology

The mission of the Center for Instructional Technology (CIT) is to assist UNC-Chapel Hill faculty, staff and graduate instructors in achieving their instructional, research and other professional objectives by providing support for commonly used and emerging information technologies. To fulfill that mission, the CIT works collaboratively with staff in Information Technology Services (ITS) and other service providers on campus to coordinate, promote and support campus-wide instructional technology-related services.

its.unc.edu/teaching-and-learning.html

Center for Mathematics and Science Education

The Center for Mathematics and Science Education applies the resources of UNC-Chapel Hill to improve mathematics and science education in North Carolina. The center is affiliated with the North Carolina Mathematics and Science Education Network (NC MSEN). The center implements its mission by offering: 1) professional development activities for teachers of mathematics and science; 2) collaborative professional development and curriculum improvement projects supporting the reform efforts of local school systems; 3) the NC MSEN Pre-College Program, a student encouragement program in mathematics and science serving students of grades 6–12 in the Alamance-Burlington, Chapel Hill-Carrboro, Durham and Orange County school systems; and 4) support for School of Education degree and nondegree programs for new teachers and for experienced teachers.

www.unc.edu/depts/cmse

Center for Pharmaceutical Outcomes Research

The mission of the Center for Pharmaceutical Outcomes Research is to improve patient health outcomes, primarily those associated with the use or potential use of pharmaceuticals. The center will advance the field of health outcomes through methodology development, evaluative research and the translation of research findings to clinical practice and pharmaceutical education.

Center for Public Television

The University of North Carolina Center for Public Television operates a statewide network of 11 digital transmitters with a commitment to inform, enrich and educate viewers. Each transmitter broadcasts four channels of standard definition programming and one channel of high definition programs. In addition to UNC-TV they are: UNC-KD, a children's channel, UNC-ED, an educational channel, UNC-HD, a high definition channel and UNC-NC, a channel that eventually will be dedicated entirely to local content.

UNC-TV also supports a wide variety of outreach activities, including partnerships with educational and social service agencies; college telecourses for credit to more than 17,500 adults yearly; educational support for teachers; and a comprehensive Web site. UNC-TV actively seeks partnerships with others to bring greater focus to the key cultural and social issues in North Carolina.

www.unctv.org

Center for Research on Chronic Illness

CRCI provides central resources and facilities to both seasoned and novice investigators actively conducting research to assist individuals and groups to establish and maintain favorable health behaviors. Individuals and groups at high risk, or vulnerable, for developing or incurring chronic health problems are the major focus of CRCI research. Vulnerable people include the poor, marginalized communities, those at critical development stages of life (childhood, adolescence, or old age) and residents of rural or underserved areas.

(919) 966-0453

www.unc.edu/depts/crci

Center for Slavic, Eurasian and East European Studies

Inasmuch as the mission of the University is the generation, preservation, transmission and dissemination of useful knowledge, the mission of the Center for Slavic, Eurasian and East European Studies is entirely coherent with that mission, particularly honed to the subset of knowledge pertaining to the languages, cultures and political systems of the Slavic, Eurasian and East European peoples and countries.

(919) 962-0901

www.unc.edu/depts/slavic

Center for Stochastic Processes

The Center for Stochastic Processes, within the Department of Statistics, provides a framework for substantial research activity in the areas of stochastic processes and related probability for significant interaction among the permanent faculty, senior and junior visitors. The weekly Stochastic Process Seminar is a forum for exchange of current research ideas, and the center's Technical Report Series contains the research produced by permanent and visiting staff prior to publication in the scientific literature. A centerpiece of the program was the incorporation of visiting faculty—with a careful balance of new research scholars and established senior workers. This has naturally resulted in extensive research production, as may be seen from the technical reports of the center and the published papers.

(919) 962-1048
www.stat.unc.edu/center.html

Center for the Study of the American South

The Center for the Study of the American South affirms the commitment of the University of North Carolina at Chapel Hill to the study of the South, to teaching about the region and to a tradition of service spanning two centuries. Through myriad programs, publications and conferences the center seeks to sponsor a broad public dialogue that addresses the central challenges to public life in the South. What is this shared Southern history and culture that both divides and unites Southerners? What threats to the region are posed by persistent poverty, a decline in civility and the fragmentation of communities by racism and migration? How are recent changes to the region redefining opportunity in a global economy, transforming landscapes and radically reshaping communities? The center brings the University's vast resources to bear on these questions.

(919) 962-5665
www.unc.edu/depts/csas

Center for Teaching and Learning

The mission of the Center for Teaching and Learning (CTL) is to support teaching and learning at all levels and in all contexts in which instruction occurs in the University. In pursuing this goal, the center works to enhance the intellectual climate and promote open and ongoing dialogue among all members of the University community and serves as an advocate for academic initiatives, as these enterprises relate to teaching and learning. CTL serves the University community as the primary academic development unit for faculty, departments and curricula; it is strategically placed in the Office of the Executive Vice Chancellor and Provost to promote continuous quality improvement in teaching and learning for all instructors across the UNC campus.

CTL promotes undergraduate and graduate professional education in a wide variety of ways. The center is actively involved in the day-to-day instructional activities of hundreds of faculty members, graduate teaching assistants and their academic departments campus-wide. CTL programs target the development of teaching skills of instructional personnel, curriculum development and renewal, course development, equipment and materials support for in-class instruction, the use of technologies in teaching and evaluation of instructional offerings. Through these activities, CTL indirectly contributes to the education of every undergraduate and graduate student on campus.

Professional staff in the Graduate Teaching Assistant (GTA) Development Program are responsible for helping graduate students develop their pedagogical skills and document their teaching practices from the time they receive their appointments as teaching assistants throughout their tenure at UNC-Chapel Hill. CTL consultants also help graduate students without GTA appointments develop the instructional skills that they need for their professional responsibilities in adult education, patient education, etc. GTA development is accomplished by individual consultations, open-enrollment workshops, meetings with a GTAs and faculty on departmentally defined issues, support for comprehensive programs with departments that utilize GTAs, teaching courses on college teaching and collaborative programs with The Graduate School. Through these activities, CTL contributes directly to the education of virtually every graduate student at UNC-Chapel Hill who receives a teaching assignment, and a significant number of those who will teach in other settings.

(919) 966-1289
ctl.unc.edu

Center for Urban and Regional Studies

The center's mission is to promote and support within UNC-Chapel Hill, high quality basic and applied research on urban, regional and rural planning and policy issues. The center seeks to generate new knowledge of urban and regional processes and problems and ultimately to improve living conditions in our communities. This is done by involving the University's faculty and graduate students in large, multidisciplinary research projects and smaller, more narrowly focused projects. The center's mission also includes promoting the use of the research it facilitates.

(919) 962-3074
curs.unc.edu

Center for Aging and Diversity

The Center for Aging and Diversity addresses, through research and training, health disparities in later life, provides a forum in which to discuss and examine ethnic, racial and cultural variation in life course processes, and disseminates research findings to the academic and lay community on the health of older diverse populations.

www.aging.unc.edu/cad/index.html

Clinical Center for the Study of Development and Learning

The Clinical Center for the Study of Development and Learning (CDL) is a multidisciplinary research, technical assistance and leadership training center. The center is dedicated to improving the lives of individuals with developmental disabilities. Its work covers the broadest range of dysfunctions and handicaps, from learning disorders and attention deficits to mental retardation and multiple handicapping conditions.

(919) 966-5171
cdl.unch.unc.edu

Collaborative Studies Coordinating Center

The Collaborative Studies Coordinating Center (CSCC) is a division within the Department of Biostatistics of the School of Public Health at the University of North Carolina at Chapel Hill. As the coordinating center for a number of multicenter public health and medical studies, it provides statistical, data management, quality assurance and study management services. The organization includes professional personnel from biostatistics, epidemiology, computer science/data management, medicine, pharmacy and nutrition. The professional personnel are supported by staff with training and experience in all of these fields as well as in study management, office management and communication.

www.cscc.unc.edu

Comprehensive Center for Inflammatory Disorders

Established in 1999, the Comprehensive Center for Inflammatory Disorders (CCID) is one of six national Comprehensive Oral Health Research Centers of Discovery created by the National Institute of Dental and Craniofacial Research to improve the oral health of Americans. The CCID faculty conducts basic, clinical epidemiological and community-based research on inflammatory disorders such as periodontal disease, cardiovascular disease and diabetes, and on at-risk pregnant women. The center also provides comprehensive specialized oral health care to patients with periodontal disease, diabetes and cardiovascular disease, and on patients with at-risk pregnancies. Finally, the center provides educational opportunities for scientists, professionals and the public on the links between inflammation and systemic medical conditions.

(919) 966-1455
www.dent.unc.edu/research/ccid

Cystic Fibrosis Pulmonary Research Center

The Cystic Fibrosis Pulmonary Research and Treatment Center is a large, multidisciplinary group focused on the pathogenesis and therapy of cystic fibrosis and other lung diseases.

(919) 966-1077
www.med.unc.edu/wrkunits/3ctrpgm/cystfib/

Dental Research Center

The Dental Research Center provides a central base for the research carried out by the Dental School by making available well-equipped laboratories and core research support facilities. The center fosters collaborative research relationships for faculty throughout the University and offers opportunities in graduate research training for basic sciences and clinical specialty students.

www.dent.unc.edu/research

Frank Porter Graham Child Development Institute

The research mission of the Frank Porter Graham Child Development Institute is to create new knowledge to enhance the lives of young children and their families. Emphasis has and will be placed on the study of vulnerable populations, such as those at risk, the disabled, or the disadvantaged.

(919) 966-2622
www.fpg.unc.edu

The UNC Center for Functional GI and Motility Disorders

Mission: Advancing the biopsychosocial understanding and care of patients with functional gastrointestinal (GI) and motility disorders through research, training and education.

The center's goals are:

- *Research:* Conducting studies on the physiological and psychosocial mechanisms underlying the functional GI and motility disorders, their impact on quality of life, health outcome and their treatment
- *Professional Training and Education:* Providing multidisciplinary training and education in clinical and research skills with emphasis on patient-centered care and advanced research methods
- *Evaluation and Treatment:* Applying up-to-date evaluation and treatment for a full range of functional GI and motility disorders

General Center Information: (919) 966-0144; Center Coordinator (919) 843-0821
www.med.unc.edu/medicine/fgidc/welcome.htm

Gene Therapy Center

The University of North Carolina School of Medicine created the Gene Therapy Center in 1993 with the goal of merging molecular genetics research with health care delivery. The Gene Therapy Center provides important resources to academic investigators through two core facilities created to support preclinical and clinical gene therapy studies. These facilities, the Vector Core and the Human Applications Laboratories, were created to ensure that investigators would have promising gene vectors available in the quality and quantities needed for preclinical or clinical studies. Research in the laboratory has centered on the molecular biology of adeno-associated virus (AAV) in order to exploit the unique features of this virus to develop an efficient viral vector system for use in human gene therapy. Continued efforts in understanding the mechanism of viral replication and integration for both wild-type and recombinant AAV are being pursued in order to create more efficient gene transfer vectors. The ultimate goal of the Gene Therapy Center is to facilitate the progression and translation of gene therapy research from the laboratory bench into Phase I clinical trials for the treatment of human disease.

(919) 962-3285
genetherapy.unc.edu

General Clinical Research Center

The mission of the General Clinical Research Center (GCRC) is to provide an optimal setting for investigation of both normal and abnormal body function; to create facilities where the cause and the natural history of human illness can be defined and where disease progression, prevention, control and cure can be studied; to encourage, develop and maintain a national core of expert clinical investigators; to create an environment where all types of health professionals can be trained in the many aspects of clinical research; and to expedite the translation of advances in basic scientific knowledge into new or improved methods for patient care.

(919) 966-1435
verne.med.unc.edu

Highway Safety Research Center

The Highway Safety Research Center (HSRC) is dedicated to improving transportation safety, with a major emphasis on highway safety. Its fundamental mission is to conduct basic and applied research that increases knowledge and contributes to reducing death, injury and the related societal costs. HSRC translates developed knowledge into practical interventions that can be applied at local, state, national and international levels.

(919) 962-2202
www.hsrc.unc.edu

Injury Prevention Research Center

Injury is a major, but under-recognized, public health problem worldwide. In the United States alone, about 150,000 people die of injuries each year, resulting in more years of life lost before age 65 than any other single health problem. In addition to loss of life, the pain, suffering and long-term disability associated with injuries are enormous. Most of these injuries are preventable, but there is much to learn. More must be understood about the factors that influence when, how, where and to whom injuries will occur, and effective and appropriate intervention strategies must be designed and implemented.

The UNC Injury Prevention and Research Center (IPRC) envisions a world in which injuries are reduced as a result of important discover-

ies made and disseminated in a scholarly manner to guide policies and program development. Its vision includes a leadership role for UNC IPRC in effecting change both nationally and internationally.

The mission of the IPRC is to build the field of injury prevention and control through a combination of interdisciplinary scholarly approaches to research, intervention and evaluation as well as through the training of the next generation of researchers and practitioners.

The UNC IPRC strives to be an innovative, nurturing, efficient, highly productive and versatile organization that believes in

- Promoting rigor and integrity in all aspects of its work;
- Identifying, creating and seizing opportunities to enhance scientific progress and application of knowledge to prevent injury;
- Creating an intellectual home in which faculty, staff and students find collegiality, mentoring and assistance in realizing their professional and academic goals;
- Embracing new ideas with enthusiasm while planning strategically for the future;
- Nurturing an atmosphere of open communication, sharing of ideas and interdisciplinary collaboration in which good science and practice merge;
- Supporting forward-thinking leadership that brings national and international perspectives;
- Providing high quality service to affiliated faculty, staff and students for project development management and dissemination;
- Ensuring that all are clear about their roles and responsibilities and do what they are supposed to do;
- Fostering synergies among ideas, individuals and functions such that all engaged with the center contribute fully based on their unique and complementary roles; and
- Being adaptable to shifts in leadership, staffing and external conditions while maintaining organizational stability.

(919) 966-2251
www.iprc.unc.edu

Kenan Center for the Utilization of Carbon Dioxide in Manufacturing

The Kenan Center for the Utilization of Carbon Dioxide in Manufacturing is dedicated to this sustainable vision of technological, scientific and educational advances in processing systems. The elucidation of the fundamental science and engineering principles that will make these possibilities become reality, in collaboration with industrial partners, is the mission of the Kenan Center. The center is comprised of chemists, chemical engineers and materials scientists from the University of North Carolina at Chapel Hill and North Carolina State University. More than 20 faculty and 40 students and postdoctoral associates participate in Kenan Center research. National Laboratory partners at Oak Ridge, Los Alamos and Pacific Northwest allow use of their facilities for Kenan Center investigations, and industrial members provide financial support and guidance.

www2.ncsu.edu/champagne

UNC Lineberger Comprehensive Cancer Center

The UNC Lineberger Comprehensive Cancer Center of the School of Medicine of the University of North Carolina at Chapel Hill is the public cancer center for North Carolina. The UNC Lineberger center is the focal point for cancer research and cancer-related activities at UNC-Chapel Hill. It has an organized program for postdoctoral training of basic science and prevention and control cancer research. Curricular goals of the UNC Lineberger Comprehensive Cancer Center are implemented through academic departments. Cancer center members direct or participate in a wide variety of training programs. The center's activities are interdisciplinary, and its 235 members are drawn from more than 25 departments in the UNC School of Medicine, the School of Public Health, the schools of Dentistry, Nursing, Pharmacy and the College of Arts and Sciences. The UNC Lineberger Center features nine research programs that are organized in three areas: basic science, clinical science and population sciences. Basic scientists study various aspects of cancer development and progression at the molecular level. Programs include cancer cell biology, immunology, molecular carcinogenesis, molecular therapeutics, virology and cancer genetics. A clinical research program focuses on developing novel approaches to cancer diagnosis and treatment. The population sciences programs include cancer prevention and control research and cancer epidemiology which seek to understand the causes of cancer in human populations and to develop, test and disseminate interventions to reduce cancer risk, increase early detection, enhance cancer survivorship and reduce mortality from cancer.

(919) 966-3036
cancer.med.unc.edu

National Center for Catastrophic Sport Injury Research

The National Center for Catastrophic Sport Injury Research collects and disseminates death and permanent disability sports injury data that involve brain and/or spinal cord injuries. The research is funded by a grant from the National Collegiate Athletic Association, the American Football Coaches Association and the National Federation of State High School Associations. This research has been conducted at The University of North Carolina at Chapel Hill since 1965.

(919) 962-5171
www.unc.edu/depts/nccsi

Neurodevelopmental Disorders Research Center

The National Institute of Child Health and Development created the Neurodevelopmental Disorders Research Center in 1967. The center, one of only 12 such research centers in the country, studies mental retardation and other developmental disorders. Its primary mission is to promote research and research training in the pathogenesis and treatment of neurodevelopmental disorders.

(919) 843-8641
www.fpg.unc.edu/~ndrc

Neuroscience Center

The mission of the Neuroscience Center is to promote neuroscience research with a specific emphasis on developmental, cellular and disease-related processes.

www.neuroscience.unc.edu

North Carolina Center for Nanoscale Materials

The North Carolina Center for Nanoscale Materials (NCCNM) was officially established in April 1998. Major funding is provided by the Office of Naval Research, UNC-Chapel Hill and (North Carolina State University (NCSU). The center currently has 15 associated faculty members from several academic units at UNC-Chapel Hill and NCSU, and supports eight postdoctoral fellows and 15 graduate research assistants. The research activities in the center are directed toward understanding the fundamental science of nanoscale materials and utilizing their unique properties for commercial applications.

www.physics.unc.edu/~zhou/muri

North Carolina Occupational Safety and Health Education and Research Center

The North Carolina Occupational Safety and Health Education and Research Center (NCOSHERC) is an interinstitutional, multidisciplinary organization committed to graduate education and continuing education training of occupational health and safety professionals.

(888) 235-3320, (919) 962-2101, oshercww@sph.unc.edu
osherc.sph.unc.edu

Research Support Center

The School of Nursing's Research Support Center (RSC) facilitates faculty and student research endeavors with particular emphasis on expanding the research base in the School of Nursing, increasing external funding for research and developing new scholars and their programs of research. The center provides a broad array of research support services, including consultation in the areas of research design , advanced statistical support including and measurement; and statistical analysis and analysis programming; preparation of research grant proposals; assistance with institutional grant processing; editorial assistance; computer short courses for faculty and students of the School of Nursing; and grant fiscal management. The RSC maintains information on funding sources, research conferences and faculty research interests, and publishes a newsletter highlighting grant and conference opportunities, research and computing news, and faculty research activities. The RSC also manages school-awarded small grants programs.

(919) 966-5803
www.unc.edu/depts/rsc

Sheps Center for Health Services Research

(see Cecil G. Sheps Center for Health Services Research)
www.shepscenter.unc.edu

Sonja Haynes Stone Center for Black Culture and History

Mission: To encourage and support the critical examination of all dimensions of African American and African diaspora cultures through sustained and open discussion, dialogue and debate, and to enhance the intellectual and sociocultural climate at the University of North Carolina at Chapel Hill.

(919) 962-9001
sonjahaynesstonectr.unc.edu

Thurston Arthritis Research Center

Independence is an American right. Self-sufficiency is an American ambition. Freedom of movement is an American assumption. The Thurston Arthritis Center draws from the spirit of this national psyche to create powerful instruments to lessen the suffering and immobility of those with arthritis-related diseases and to enhance the miracles of scientific vision.

(919) 966-4191
tarc.med.unc.edu

Tissue Culture Facility

The mission of the Tissue Culture Facility is to provide the members and colleagues of the UNC Lineberger Comprehensive Cancer Center with the highest quality research services and products available and to support and expand the science of cancer and medical research with professionalism and dedication.

www.unc.edu/depts/tcf/info.html

Center for Global Initiatives

Formerly known as the University Center for International Studies (UCIS), the Center for Global Initiatives is a catalyst for the innovative work of faculty and students.

The center offers an array of competitive funding opportunities including the Fulbright Program, curriculum development, international internships, conference participation, undergraduate research and predissertation travel.

It generates flows of ideas through research projects such as the annual Navigating the Global American South conference and the book *Going to Carolina del Norte: Narrating Mexican Migrant Experiences*, through programs such as the Rotary Peace Center and K-12 Outreach and through online resources highlighting faculty expertise and student internship experiences.

Founded in 1993, the center has received $20 million in grants from agencies and private donors including Ford, Freeman, MacArthur, Mellon, National Science Foundation, Z. Smith Reynolds, Rockefeller, Rotary International, United Nations University, U.S. Agency for International Development, the U.S. Department's of State and Education and the World Bank.

The center's director reports to the associate provost for international affairs, who leads the University's effort to raise its international profile. This institutional connection offers a broad academic scope spanning the entire University, and the Center for Global Initiatives complements the work of other units focusing on thematic and area studies, study abroad, service learning, career services and external relations.

To learn more about the Center for Global Initiatives, stop by its offices on the third floor of the new FedEx Global Education Center. The center encourages discussion of innovative ideas that expand and amplify the global work of UNC.

gi.unc.edu

Research Laboratories

Baity Air Engineering Laboratory

The Baity Air Engineering Laboratory is one of the premier industrial hygiene, air pollution control and aerosol science research facilities in the country. The laboratory is part of the Department of Environmental Sciences and Engineering at The University of North Carolina at Chapel Hill. It includes a 2,000-square-foot bay for testing air pollution control devices with a 3-ton overhead crane on a 25-foot ceiling. The laboratory also contains a 200-cubic-foot wind tunnel, fans capable of moving 10,000 cfm, an aerosol physics laboratory, a chemistry laboratory and office space. In addition, high bay space and analytical laboratories are available to conduct pilot scale experiments on water quality. The Baity Laboratory is housed in its own building adjacent to the UNC School of Public Health.

www2.sph.unc.edu/baitylab

Research Laboratories of Archaeology

The Research Laboratories of Archaeology were established in 1939 to conduct studies in archaeology and related fields such as ethnography, physical anthropology and ethnohistory. Today, the research laboratories' interdepartmental program pursues research in such areas as North American prehistory and history (with a focus on the Native American cultures of North Carolina), Latin American prehistory, Old World archaeology, paleo-ethnobotany and human osteology. Rigorous field

and laboratory training is provided for graduate and undergraduate students. The Research Laboratories of Archaeology also curate one of the nation's finest collections of southeastern archaeological materials, including more than 6,000,000 artifacts, extensive photographic collections dating from the 1930s and smaller archaeological and ethnographic collections from Latin America, Europe and Japan.

rla.unc.edu

L. L. Thurstone Psychometric Laboratory

The mission of the L. L. Thurstone Psychometric Laboratory is to support the faculty and students of the laboratory in the development and application of quantitative methods for psychological research. The laboratory seeks to create an active and vital intellectual atmosphere for its members so as to facilitate a high level of scholarly effort and interaction. Toward this end, the laboratory secures and manages resources that support these research activities and goals. This support takes a variety of forms, including financial, administrative and logistical. Laboratory resources are expended for purposes such as financial support of graduate students, upgrading of facilities and equipment, funding of student travel to conferences or workshops, sponsoring of visiting speakers, and sponsoring and hosting of academic conferences. The laboratory also seeks to establish and promote productive associations with other academic units at the University of North Carolina. These include the Departments of Statistics, Biostatistics, Linguistics and Computer Science, as well as the Howard W. Odum Institute for Research in Social Science (IRSS), the Center for Developmental Science and the Frank Porter Graham Child Development Institute. Each of these units is engaged in research and teaching relevant to members of the laboratory. Faculty of the laboratory collaborate in research with faculty in these units, and the laboratory's graduate students often take courses in these departments and become involved in research activities.

www.unc.edu/depts/quantpsy/thurstone

Triangle Universities Nuclear Laboratory

The Triangle Universities Nuclear Laboratory (TUNL) is a cooperative research laboratory located on the Duke University campus and supported by Duke University, North Carolina State University and the University of North Carolina at Chapel Hill. Fifty faculty and graduate students from the three universities use the facilities. TUNL is the largest university-based nuclear physics laboratory in the southeast, and one of the largest such laboratories in the United States. The major research interests of TUNL are studies of fundamental symmetries and studies of nuclear interactions at low to medium energies in the one to twenty million-electron-volt range.

secretary@tunl.duke.edu

www.tunl.duke.edu

University Regulations and Policies

The Honor Code

Persons enrolled in The Graduate School are members of the student body of the University of North Carolina at Chapel Hill, and are held responsible for conducting themselves in conformity with the moral and legal restraints found in any law-abiding community. They are, moreover, subject to the regulations of the Honor Code.

The Honor Code is the heart of integrity at Carolina. In brief, the Honor Code states that all students shall "refrain from lying, cheating or stealing," but the Honor Code imparts much more. It is the guiding force behind the responsible exercise of freedom, the foundation of student self-governance at UNC. By abiding by the Honor Code, students can be assured that their individual rights and academic work will be respected.

Mutual Responsibilities of the Faculty and Students

Academic work is a joint enterprise involving faculty and students. Both have a fundamental investment in the enterprise and both must share responsibility for ensuring its integrity. In relation to the Honor Code, therefore, specific responsibilities of the faculty which parallel the responsibilities of the students have been formally adopted by the Faculty Council.

Responsibilities of the Faculty

I. *Awareness:* To assure that community-wide expectations regarding academic integrity are understood and communicated, and that students are held accountable for conforming their conduct to such expectations.

II. *Communicating Expectations and Administering Examinations:* To assist students in complying with their responsibilities relating to academic integrity, faculty members, teaching assistants, and other instructional personnel should

A. Use good judgment in setting and communicating clear ground rules for academic work conducted under their supervision.

B. Require students to sign the honor pledge as a condition of submitting academic assignments.

C. Take steps to prevent unauthorized access to examinations during development, duplication and administration.

D. Avoid re-using prior examinations in whole or in part to the extent possible.

E. Take all reasonable steps consistent with physical classroom conditions to reduce the risk of cheating during the administration of examinations.

F. Maintain proper security during the administration of examinations, including, as appropriate, overseeing distribution and collection of examinations and proctoring the examination session.

III. *Oversight:* In the event of student misconduct that appears to violate the requirements of the Honor Code, faculty members, teaching assistants and other instructional personnel should

A. Report to the appropriate Student Attorney General any instance in which the instructor has reasonable basis to conclude that a student under the faculty member's supervision has engaged in academic dishonesty or substantially assisted another to do so in connection with academically related work.

B. In the instructor's discretion, notify the student of the instructor's intention to report the suspected academic dishonesty and permit the student to provide relevant further information if the student chooses to do so.

C. Refrain from taking unilateral punitive action as to a student rather than reporting conduct in suspected violation of the Honor Code.

D. Cooperate with representatives of the Honor System in conducting necessary investigation, providing testimony or other evidence, recommending appropriate sanctions or otherwise bringing the matter to prompt conclusion.

IV. *Involvement:* To bring to bear requisite faculty judgment regarding the nature and importance of academic integrity, and to nourish a strong campus-wide understanding and commitment to associated intellectual and personal values, faculty members, teaching assistants and other instructional personnel should

A. Explore issues of integrity in connection with instructional activities where relevant and appropriate.

B. Encourage their academic units to take matters of academic integrity seriously, become informed regarding related problems and advisable means of preventing problems from arising, and provide requisite training and support to instructional personnel.

C. Participate upon request as part of educational initiatives, faculty advisory panels and University Hearing Boards designed to create, nurture and enforce high standards of academic integrity within the University community.

Responsibilities of Students

In order to ensure effective functioning of an Honor System worthy of respect in this institution, students are expected to

I. Conduct all academic work within the letter and spirit of the Honor Code, which prohibits the giving or receiving of unauthorized aid in all academic processes.

II. Consult with faculty and other sources to clarify the meaning of plagiarism, to learn the recognized techniques of proper attribution of sources used in the preparation of written work and to identify allowable resource materials or aids to be used during examination or in completion of any graded work.

III. Sign a pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work.

IV. Comply with faculty regulations designed to reduce the possibility of cheating—such as removing unauthorized materials or aids from the room and protecting one's own examination paper from the view of others.

V. Maintain the confidentiality of examinations by divulging no

information concerning an examination, directly or indirectly, to another student yet to write that same examination.

VI. Treat all members of the University community with respect and fairness.

VII. Report any instance in which reasonable grounds exist to believe that a student has given or received unauthorized aid in graded work or in other respects violated the Honor Code. Such report should be made to the Office of the Student Attorney General, the Office of the Dean of Students or other appropriate officer or official of their college or school.

VIII. Cooperate with the Office of the Student Attorney General and the defense counsel in the investigation and hearing of any incident of alleged violation, including the giving of testimony when called upon.

Procedure for Reporting

Members of the University community who wish to report possible violations of the Honor Code should contact the Student Attorney General (966-4084) or the Office of the Dean of Students (966-4042). Faculty members who have cause to report a student should use the online report form available at the following Web site: honor.unc.edu.

Alcoholic Beverages Policy

(For complete alcoholic beverages policy, see appendix.)

A policy on student possession and consumption of alcoholic beverages in facilities of the University of North Carolina at Chapel Hill has been promulgated by the vice chancellor for Student Affairs, with the approval of the chancellor, to inform students of the conditions under which alcoholic beverage use consistent with federal, state and local laws and ordinances is permitted in University facilities and on University property. Copies of the policy may be obtained from the Office of the Dean of Students, located in the Student and Academic Services Building. The text of the policy can be accessed on the Web at www.unc.edu/campus/policies/studentalcohol.html.

Drug Policy

(For complete drug policy, see appendix.)

Students, faculty members, administrators, and other employees of the University of North Carolina at Chapel Hill are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver or manufacture those drugs designated collectively as 'controlled substances' in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the University community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the University. Also, recent federal legislation requires, as a condition of employment, that any faculty or staff member engaged in the performance of a federal grant or contract must abide by the University's Drug Policy and must notify his or her dean, director or department chair of any criminal drug statute conviction for a violation occurring in the work place not later than five days after the conviction.

Disciplinary proceedings against a student, faculty member, administrator or other employee will be initiated when the alleged conduct is deemed to affect the University's interests. Penalties will be imposed for violation of the policies of the University only in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators and other employees. The penalties that may be imposed range from written warnings with probationary status to expulsions from enrollment and discharges from employment.

Every student, faculty member, administrator and other employee of the University is responsible for being familiar with and complying with the terms of the Policy on Illegal Drugs adopted by the Board of Trustees. Copies of the full text of that policy are available from each student's dean, director or department chair, or from the Office of the Dean of Students or the counseling service of the Office of Human Resources.

Smoking Policy

Smoking is prohibited in University facilities, residence hall rooms, apartments and common area spaces, including hallways, lounges, lobbies, stairwells, laundries, vending areas, balconies, breezeways, connectors and porches. Additionally, smoking is not permitted within 100 feet of any University building, or in state-owned vehicles.

Disciplinary Records

Disciplinary files and records of cases that resulted in "not guilty" findings will be destroyed immediately after the hearing that rendered the "not guilty" verdict. Disciplinary files and records on other adjudicated cases will be maintained for 10 years after all appeal rights have expired or have been exhausted, and then destroyed. Files on pending cases will be maintained indefinitely.

Release of information contained in a student's disciplinary file or other records is governed by the provisions of the 1974 Family Educational Rights and Privacy Act.

Nondiscrimination Policy

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, it is therefore the University's policy not to discriminate in offering access to its educational programs and activities or with respect to employment terms and conditions on the basis of age, gender, race, color, national origin, religion, creed, disability, veteran's status, gender identity, sexual orientation or gender expression. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied (see www.unc.edu/campus/policies/nondiscrim.html). A copy of the University's EPA and SPA Equal Opportunity Plans is available on the University's Web site at www.unc.edu/depts/eooada. Any inquiries regarding the University's nondiscrimination policies should be brought to the attention of one of the following administrators, as noted:

Discrimination in employment and educational programs and activities: University EEO/ADA Officer, CB# 9160, 100 Pettigrew Hall, Chapel Hill, N.C. 27599-9160; (919) 966-3576.

Discrimination involving students: Dean of Students, CB# 5100, Suite 1106, Student Academic Services Building, 450 Ridge Road, Chapel Hill, N.C. 27599-5100; (919) 966-4042.

Sex discrimination in educational programs and activities: University

Title IX Officer, CB# 9160, 100 Pettigrew Hall, Chapel Hill, N.C. 27599-9160; (919) 966-3576.

Discrimination in employment: Associate Vice Chancellor for Human Resources, CB# 1000, 300 South Building, Chapel Hill, N.C. 27599-3000; (919) 962-1554.

The University's policy prohibiting discrimination on the basis of sexual orientation does not apply to the University's relationships with outside organizations, including the federal government, the military, ROTC and private employers.

Amorous Relationships

It is the policy of the University of North Carolina at Chapel Hill that faculty members or other instructional staff shall not initiate, pursue, or be involved in any amorous or sexual relationships with any student whom they are in a position to evaluate or supervise by virtue of their teaching, research or administrative responsibilities.

Friendships or mentoring relationships between faculty or instructional staff and students are not proscribed by this policy. Nor is it the intent of this policy that such nonamorous relationships be discouraged or limited in any way. Copies of the full text of this policy are available from each student's dean, director or department chair, the Office of the Dean of Students, the counseling service in the Office of Human Resources or online at www.unc.edu/campus/policies/prohib_harass_and_discrim.html.

Racial Harassment

Discrimination on the basis of race is unacceptable at the University of North Carolina at Chapel Hill. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail if the University is to fulfill its purposes.

Because there may be conflict among freedom of speech, the right of individuals to be free from injury caused by discrimination and the University's duty to protect the educational process, the enforcement of procedures shall recognize that it may be necessary to have varying standards depending upon the place of the conduct in question. Thus a distinction may be drawn among public forums, educational and academic centers, and housing units. Copies of the full text of this policy are available from each student's dean, director or department chair, the Office of the Dean of Students, the counseling service in the Office of Human Resources or online at www.unc.edu/campus/policies/prohib_harass_and_discrim.html.

Sexual Harassment

Sexual harassment constitutes unlawful discrimination on the basis of sex. Sexual harassment violates both law and University policy, and will not be tolerated in the University community.

Unwelcome sexual advances, requests for sexual favors and other verbal or physical conduct of a sexual nature by one in an official University position or by a fellow University employee constitute sexual harassment when

- Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or academic standing, or
- Submission to or rejection of such conduct by an individual is used as a basis for an employment or academic decision affecting that individual, or
- Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance, or creating an intimidating, hostile or offensive environment.

Copies of the full text of this policy are available from each student's dean, director or department chair, the Office of the Dean of Students, the counseling service of the Office of Human Resources or online at www.unc.edu/campus/policies/prohib_harass_and_discrim.html.

Policy on Sexual Orientation Nondiscrimination

The University has adopted an internal policy on nondiscrimination on the basis of sexual orientation. That policy provides that educational and employment decisions should be based on individuals' abilities and qualifications and should not be based on irrelevant factors or personal characteristics that have no connection with academic abilities or job performance. Among the traditional factors that are generally "irrelevant" are age, race, color, sex, religion, national origin and disability. It is the policy of the University of North Carolina at Chapel Hill that an individual's sexual orientation be treated in the same manner. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied. This policy prohibiting discrimination on the basis of sexual orientation does not apply to the University's relationships with outside organizations, including the federal government, the military, ROTC and private employers. Copies of the full text of that policy are available from each student's dean, director or department chair, the Office of the Dean of Students, the counseling service of the Office of Human Resources or online at www.unc.edu/campus/policies/prohib_harass_and_discrim.html.

Transportation and Parking

Parking

Every student at UNC-Chapel Hill and UNC Hospitals who parks an automobile between 7:30 a.m. and 5:00 p.m. on weekdays in the University's designated reserved parking is required by the Department of Public Safety to obtain and display a parking permit. Parking permit holders must park only in specific zones as indicated on their parking permits. After 5:00 p.m. on weekdays, however, students may park in any unreserved space except those in resident student lots, which are reserved until 9:00 p.m. Please note the signs at the entrances to each lot which detail the hours of enforcement for that parking area.

Motor vehicle parking permits may be applied for during normal registration procedures at the Department of Public Safety. Vehicles found parked illegally may be cited by the Department of Public Safety's Parking Control Division, and subsequent violations may result in further citations, immobilization ("booting") or towing of the vehicle. *Citations may be appealed through the Department of Public Safety's Appeals Office within 10 calendar days upon receipt of the citation. Citations can be appealed in person during office hours Monday through Friday from 7:30 a.m. to 5:00 p.m., online at www.dps.unc.edu or by regular mail.*

The Parking Control Division operates MAP, the cost-free Motorist

Assistance Program. If a vehicle requires a "jump start" or if the keys are locked inside the vehicle, motorists may call for assistance at 962-8006, weekdays, 7:00 a.m. until 9:00 p.m. During all other times (and on University holidays), the UNC Police Department should be contacted for motorist assistance at 962-8100.

The Commuter Alternatives Program

The Commuter Alternatives Program (CAP) is an initiative with the goal of reducing campus traffic congestion and parking demand through the promotion and management of viable alternatives to single-occupancy vehicle use at UNC. It is a free program designed to reward campus community members for the use of bicycling, walking, transit, park and ride services, and ridesharing. CAP requires only that a registrant commute to UNC from outside a two-mile radius from the Bell Tower at the center of the campus and not be registered for a parking permit. CAP has a listserv, giveaways, prizes, discounts to local merchants and daily benefits in relation to alternative transportation programs. To request a CAP brochure, call the Department of Public Safety or visit the department's Web site at www.dps.unc.edu/cap.

Alternatives to Parking

The Web site www.redefinetravel.org provides excellent information on student transportation alternatives. Redefinetravel.org is designed to give students all the information needed to ride the bus, ride with friends or bike to great destinations throughout the Triangle. The site has a Transit Trip Planner to popular destinations; schedules for TTA, DATA, CAT and Chapel Hill Transit; information about TTA's express bus to Raleigh; bike safety information and city bike maps; a calorie counter to show how active transportation affects health; information on student carpool options; and a calculator tool that calculates how much an individual can save by using alternative transportation.

Municipal and Regional Transit

UNC, Chapel Hill, and Carrboro work together to provide the fare-free Chapel Hill Transit system. No exchange of money, coupons, or display of a bus pass is needed when boarding a Chapel Hill Transit bus. Campus "U" route and "RU" (Reverse U) shuttles run in continuous loops from 7:00 a.m.–8:00 p.m., serving nearly every area on campus. Commuting students can use any of the five town park and ride lots, or they can join the Commuter Alternative Program and gain access to five additional CAP (Commuter Alternative Program) park and ride lots. Chapel Hill Transit provides free and quick service to and from campus to the park and ride lots. Student CAP participants receive one one-day occasional use pass per semester allowing free parking on S11 zoned lots. In addition, in the case of an emergency, UNC's Emergency Ride Back service is available to provide transportation to the park and ride lots or any location within Carrboro or Chapel Hill municipal boundaries. Consult the Chapel Hill Transit Guide for information on specific routes. Regional transit (to and from RDU, Raleigh and Durham) is available aboard Triangle Transit Authority (TTA) buses. Included in the full complement of regional service is express service from Raleigh to UNC and from Hillsborough to UNC. For more route information, call TTA at (919) 485-RIDE. Student members of the Commuter Alternative Program living more than two miles from the Bell Tower qualify for free annual TTA GoPasses. These passes are good for free rides on all TTA routes as well as all DATA (Durham Transit) routes. Commuting students must join the Commuter Alternative Program by visiting the Department of Public Safety Building, bringing proof of their PID number. If the student is a licensed driver, then he or she must also present a driver's license, plate, make and model of any vehicles owned and proof of auto insurance.

Park and Ride Lots

There are five town park and ride lots and four additional lots available to those who join UNC's Commuter Alternative Program. Many commuting students find the park and rides to be a reliable transportation solution. Parking is free, and all the lots receive free transit service. TTA also serves some of the lots. The nine lots ring the campus, and space is available on a first-come, first-served basis. Parking at the preferred lot is usually possible, but not guaranteed as the most popular lots fill up by the end of rush hour.

Point-to-Point

Point-to-Point transportation (P2P) offers fare-free, fixed-route service aboard their P2P Express minibuses, operating on a continuous loop around campus during evening hours, 7:00 p.m. until 3:00 a.m., seven nights a week (when residence halls are open) during fall and spring academic semesters. Students must show their UNC ONE Card to board the P2P Express. After dark, a demand-response van can be accessed by students in areas that are not served by the P2P Express route. P2P also offers fare-free, demand-response transportation service to disabled students and students going to or from Student Health Services 24 hours a day.

Safe Ride

A student-run program called "Safe Ride" aims to provide increased mobility between 11:15 p.m. and 2:30 a.m. on weekend evenings. Although it shares part of the name, this is a different program from the P2P Library Safe Ride Shuttle. There are three Safe Ride bus routes operating on Thursday, Friday and Saturday nights. They provide service between campus and many private student housing developments and other off-campus destinations after Chapel Hill Transit routes service ends for the evening. More information can be found online at www.unc.edu/saferide/index2.htm, via e-mail from saferide@unc.edu or in the Chapel Hill Transit Guide to Service.

UNC Bicycle Registration

The Department of Public Safety requires bicycle registration for bicycles stored or traveling on campus. The program serves as a deterrent to crime, aids in the identification of lost or stolen bicycles and enables the department to better plan for improved bicycle parking facilities around campus in the future. Forms for bicycle registration are available at www.dps.unc.edu/dps/alternatives/bikeregistration.htm or by visiting the Department of Public Safety. Cyclists who live more than two miles from the Bell Tower may join the Commuter Alternative Program.

Zipcar for Students 18 and Over

For students 18 and over, UNC's carsharing program, Zipcar, provides another option. For a $35 annual fee, reimbursable in driving credits if used within 30 days, UNC's four on-campus Zipcars can be reserved for short or long trips. Currently, UNC has a Honda Civic, a Ford Escape, a Toyota Matrix station wagon and a Mazda 3—all 2008 models. Cars are reserved online or by using a toll-free phone number. The Zipcar membership card serves as the key to the vehicle, and a gas card is inside. Fuel, insurance and maintenance bills are footed by the program, and the reservation rate is $5 per hour with a $55 per day maximum fee. More information can be found by visiting www.zipcar.com/unc,

dialing 866-4ZIPCAR, or e-mailing info@zipcar.com.

For More Information

Visit the Department of Public Safety during regular business hours (weekdays, 7:30 a.m.–5:00 p.m.), in the Public Safety Building via Morrison Drive (just off Manning Drive) on south campus. For more information on Parking and Transportation at UNC-Chapel Hill, log onto the Department of Public Safety's Web site at www. dps.unc. edu. Concerns may be addressed at the following campus telephone numbers:

- General Information 962-3951, 3952
- Police Emergencies 911
- Police Nonemergencies 962 -8100
- Parking Control 962-8006
- Accounts Receivable 962-6073
- Parking Appeals 962-3953
- Visitor Pay Operations Parking 966-4424
- Point-to-Point Shuttle Dispatcher 962-7867 (962-"P-TO-P")
- Commuter Alternatives Program 843-4414

Students with temporary physical handicaps or other hardships requiring special consideration should contact the Department of Disability Services for complete information on transportation options. To get specific information about steps to take to obtain a disability permit, visit the Department of Public Safety or the Web site at www.dps.unc.edu/dps/disability/application_process.htm.

Degrees Offered

Anthropology – M.A., Ph.D.
Art –
- History – M.A., Ph.D.
- Studio Art – M.F.A.

Biochemistry and Biophysics – M.S., Ph.D.
Bioinformatics and Computational Biology – Ph.D.
Biology – M.A., M.S., Ph.D.
Biomedical Engineering – M.S., Ph.D.
Business Administration – Ph.D.
Cell and Developmental Biology – M.S., Ph.D.
Cell and Molecular Physiology – M.S., Ph.D.
Chemistry – M.A., M.S., Ph.D.
City and Regional Planning – M.C.R.P., Ph.D.
Classics – M.A., Ph.D.
Communication Studies – M.A., Ph.D.
Comparative Literature – M.A., Ph.D.
Computer Science – M.S., Ph.D.
Dentistry –
- Dental Hygiene Education – M.S.
- Endodontics – M.S.
- Operative Dentistry – M.S.
- Oral Biology – M.S., Ph.D.
- Oral and Maxillofacial Pathology – M.S.
- Oral and Maxillofacial Radiology – M.S.
- Oral and Maxillofacial Surgery – M.S.
- Orthodontics – M.S.
- Pediatric Dentistry – M.S.
- Periodontology – M.S.
- Prosthodontics – M.S.

Dramatic Art – M.F.A.
Ecology – M.A., M.S., Ph.D.
Economics – M.S., Ph.D.
Education –
- Master's/Doctorate in Education – M.A., Ph.D.
- Master of Arts in Teaching – M.A.T.
- School Counseling – M.Ed.
- School Psychology – M.A., M.Ed., Ph.D.

English – M.A., Ph.D.
Exercise and Sport Science – M.A., M.S.R.A.
Folklore – M.A.
Genetics and Molecular Biology – M.S., Ph.D.
Geography – M.A., Ph.D.
Geological Sciences – M.A., M.S., Ph.D.
German Studies – M.A., Ph.D.
History – M.A., Ph.D.
Human Movement Science – M.S., Ph.D.
Information and Library Science – M.S.I.S., M.S.L.S., Ph.D.
Journalism and Mass Communication –
- Mass Communication – M.A., Ph.D.

Linguistics – M.A., Ph.D.
Marine Sciences – M.S., Ph.D.
Materials Science – M.S., Ph.D.
Mathematics – M.A., M.S., Ph.D.
Microbiology and Immunology – M.S., Ph.D.
Musicology – M.A., Ph.D.
Neurobiology – M.S., Ph.D.
Nursing – M.S.N, Ph.D.
Occupational Science – Ph.D.
Occupational Therapy – M.S.
Pathology – M.S., Ph.D.
Pharmaceutical Sciences – M.S., Ph.D.
Pharmacology – M.S., Ph.D.
Philosophy – M.A., Ph.D.
Physics – M.S., Ph.D.
Political Science – M.A., Ph.D.
Psychology – M.A., Ph.D.
Public Administration – M.P.A.
Public Health –
- Biostatistics – Dr.P.H., M.P.H., M.S., M.S.P.H., Ph.D.
- Environmental Sciences and Engineering – M.P.H., M.S., M.S.E.E., M.S.P.H., Ph.D.
- Epidemiology – M.P.H., M.S.C.R., M.S.P.H., Ph.D.
- Health Behavior and Health Education – Dr.P.H., M.P.H., M.S.P.H., Ph.D.
- Health Policy and Administration –
  - Residential – M.H.A., M.P.H., M.S.P.H., Ph.D.
  - Off-campus – Dr.P.H., M.H.A., M.P.H., M.S.D.M.
- Maternal and Child Health – Dr.P.H., M.P.H., M.S.P.H., Ph.D.
- Nutrition – Dr.P.H., M.P.H., M.S., Ph.D.
- Public Health Leadership – M.P.H.
- Public Health Nursing – M.S.

Public Policy – Ph.D.
Rehabilitation Counseling and Psychology – M.S.
Religious Studies – M.A., Ph.D.
Romance Languages and Literatures – M.A., Ph.D.
Russian and East European Studies – M.A.
Slavic Languages and Literatures – M.A., Ph.D.
Social Work –
- Residential – M.S.W., Ph.D.
- Off-campus – M.S.W.

Sociology – M.A., Ph.D.
Speech and Hearing Sciences – M.S., Ph.D.
Statistics and Operations Research – M.S., Ph.D.
Toxicology – M.S., Ph.D.

Certificate Programs

Programs have various options when developing specialized studies for postbaccalaureate, graduate and professional students. A certificate program is a formal program of courses and other work (e.g., a practicum, seminar or a field study) in a field of specialization. Like an academic degree, a certificate program is offered by a host academic department or other unit and is related to an academic area of study. In some disciplines, a certificate is akin to a professional credential, while in others a certificate recognizes competence in a given skill, practice or field of study.

For additional information about certificate programs, please see gradschool.unc.edu/policies/certificates.html.

Academic Program Listings of Graduate Faculty and Courses

Appointment to the Graduate Faculty

Graduate faculty members whose appointments are current as of the publication date of this Record are listed by academic rank in the department(s) in which they serve. Comprehensive listings of the graduate faculty may also be found at gradschool.unc.edu/policies/fac-designation.html. Within the school and departmental sections of the *Graduate Record*, following the faculty member's name is a section number that students should use when registering for independent studies, reading, research and thesis and dissertation courses with that particular professor. Areas of specialization are listed for each faculty member following the section number.

Course Numbers and Credit

Courses numbered 400–699 are for advanced undergraduates and graduates; courses numbered 700–999 are for graduates only. The unit of measurement in meeting degree requirements is the semester hour—that is, one hour of lecture or at least two hours of laboratory or field work a week per semester. The number in parentheses following the course title in the sections "Courses for Graduates and Advanced Undergraduates" and "Courses for Graduates" indicates the value of the course in semester hours.

Department of Anthropology

anthropology.unc.edu
PAUL LESLIE, *Chair*

Professors

Carole L. Crumley (22) Historical Ecology, State Societies, Complex Systems Theory, Global Environmental Change, Ethnography, Ethnohistory, and Archaeology of Europe

Arturo Escobar (53) Political Ecology; Anthropology of Development, Social Movements, and Science and Technology; Latin America; Colombia

Terence M. S. Evens (5) Social Anthropology, Social Theory, Phenomenology, Ethics, Philosophical Anthropology, Collectivist Settlements

Kaja Finkler (32) Medical Anthropology, Gender and Health, Economic Anthropology, Political Economy, Globalization, Mexico, Latin America

Dorothy C. Holland (16) Identity and Agency, Activism, Social Movements, History in Person, Cultural Studies, Environmental Studies, Schooling and Work, United States

Dale L. Hutchinson (63) Bioarchaeology, Human Osteology, Forensic Anthropology, Paleopathology, Health and Nutrition, Agricultural Origins and Consequences, Southeastern and Mid-Atlantic United States, South America

Norris B. Johnson (25) Architecture, Art and Aesthetics, Photography and Visual Anthropology, Religion and Nature, Japan

Paul W. Leslie (37) Human Ecology, Biological Anthropology, Demography, Population Genetics, Reproduction, East Africa

Patricia Mcanany (75) Archaeology, Ritual Practice, Ancestor Veneration, Cultural Heritage, Economic Organization, Lithic Technology, Quantitative Methods, Mesoamerica

Donald Nonini (34) Urban Anthropology; Alternative Economic Systems; Political Anthropology; Cultural Politics of Ethnicity and Race; Globalization and Diasporas; Chinese Populations in Asia-Pacific; the Southern United States

James L. Peacock (11) History, Culture, Self, and Global Issues. Southeast Asia and Southeastern United States

Vincas P. Steponaitis (2) Archaeology, Political Economy, Chiefdoms, Quantitative Methods, Southeastern United States

Associate Professors

Brian Billman (42) Archaeology of Political Organizations, Political Economy, and Human Violence; Settlement Pattern Analysis, Household Archaeology, Heritage Preservation, Andes, and Southwestern United States

Rudi Colloredo-Mansfeld (76) Sociocultural Anthropology; Latin America; Economic and Social Change in Indigenous Communities in the Ecuadorian Andes; Indigenous Political Movements; Material Culture and Social Process

Robert E. Daniels (4) Social Anthropology, Psychological Anthropology, Systems Theory, Africa

Glenn D. Hinson (36) Folklore and Folklife, Ethnography of Communication, Belief Studies, Public Folklore, African American Expressive Culture; African Diaspora, the American South

Valerie Lambert (58) American Indians, Sovereignty, Tribal Nation-Building, Tribal Governance, Oklahoma

Christopher Nelson (64) History and Memory, Everyday Life, Ethnography, Critical Theory, Storytelling, Ritual and Performance, Japan and Okinawa

Peter Redfield (54) Anthropology of Science and Technology, Colonial History, Ethics, Humanitarianism and Human Rights, NGOs and Transnational Experts, Europe, French Guiana, Uganda

Michele Rivkin-Fish (73) Medical Anthropology, Gender, Reproductive Politics, Health Care, Postsocialisms, Anthropology and Demography, Medical Education, Russia, Poland

Patricia Sawin (44) Gender, Ethnography of Communication, Performance and Poetics, Local/Global Cultures, Southern United States, Latin America

C. Margaret Scarry (48) Archaeology, Paleoethnobotany, Subsistence Economy, North America, Chiefdoms

Karla Slocum (56) Globalization, Social Movements, Place, Race, Political Economy, Gender; the Caribbean, North America

Silvia Tomaskova (59) Archaeology, Paleolithic Europe, Archaeological Method and Theory, History of Science, Gender and Science, Hunter-Gatherer and Forager Studies

Margaret Wiener (47) Politics of Knowledge, History and Memory, Colonial Societies, Science Studies, Translation, Material Culture, Indonesia, Southeast Asia

Assistant Professors

Charles Price (62) Black and Social Identity; Oral and Life History; Jamaica and the Anglophone Caribbean; Southern United States; Organizing and Capacity Building; Welfare and Higher Education Policies

Mark Sorensen (67) Biological Anthropology, Health and Culture Change, International Health, Adaptability, Nutrition, Russia, Siberia

Adjunct Professors

Jonathan Boyarin, Jewish Ethnography, Politics of Memory, Comparative Diasporas, Ethnography of Reading, Law, Temporality and the Future

R. P. Stephen Davis (40) Archaeology, Computer Applications, Settlement Systems, Contact Period, Southeastern United States

Sue E. Estroff (31) Medical, Psychiatric Anthropology, Chronic Illness, Health Policy as a Cultural System, Research Ethics, Cultural Complications of Maternal-Fetal Interventions

Richard Fox, Cultural Anthropology, Social Theory, History of Anthropology, Research Methodology, South Asia

Lawrence Grossberg, Cultural Studies, U.S. Political Culture (1950s to present), U.S. Popular Culture (20th Century), Youth Culture, Cultural and Social Theory, Contemporary Philosophy

John Pickles, Globalization, Modernity, Geographies of Social Change

Debra G. Skinner (46) Culture and Human Development, Families and Childhood Disability, Sociocultural Implications of Genetic Research, Poverty Studies, Identity and Cultural Worlds, Anthropology of Schooling, Nepal, United States

Adjunct Associate Professors

Lorraine Aragon (71), Religion and States, Arts and Intellectual Property Rights, Land Use and Ownership, Migration, Violence and Displacement, Language, Southeast Asia, Indonesia

Michael C. Lambert (51) Political Anthropology, Economic Anthropology, Africa

Barry Saunders (72) Anthropology of Biomedicine, Technologies, and Embodiment

John F. Scarry (49) Method and Theory, Cultural/Resource Management, Complex Societies, European-Native American Interaction

Philip Setel, Anthropology and Social Epidemiology of Infectious and Non-Infectious Diseases in Developing Countries; Qualitative Health Services Research; Theory and Measurement of Poverty and Marginalization; Demographic and Health Transitions

Adjunct Assistant Professors

Kia Caldwell, Gender, Race, and Citizenship in The African Diaspora; Race, Culture, and Politics in Brazil; Health and Human Rights.

Nilanjana Chatterjee (66) Political and Historical Anthropology, Migration, Gender, Postcolonial Issues, South Asia, Diaspora

William S. Lachicotte Jr. (52) Medical Institutions and Technologies, Human Services, Professions and Public Life, Practice Theories, Sociality and Identity, United States

Karaleah Reichart, Economic Anthropology, Gender and Ethnicity, Conflict Resolution and Coalition Building, Life Histories, Appalachia

Brett Riggs (60) Archaeology, Contact Studies, Southeastern United States, Ethnohistory

Sandy Smith-Nonini (74) Medical Anthropology, Anthropology of Sustainability (Energy and Economics), Professional Knowledge, Health Policy, Military Violence and Health, International Development, Social Movements, Latino Immigrants to the United States, Central America

Beverly Sizemore, Cultural Anthropology, Anthropology and Education, Literacy, Anthropology and Law, Iceland, Eritrea

Laurie C. Steponaitis (39) Archaeology, Hunter-Gatherers, Regional Survey, Settlement Patterns, Coastal Adaptations, Shellfish Analysis, Eastern North America

Research Professor

M. Jean Black, Ethnohistory, Cultural Ecology, Ethnography, North America

Research Associate Professors

William H. Jansen III, Applied Anthropology, Behavioral Factors in Public Health, Public Policy, Health Service Delivery Systems, Health Care Seeking Behavior, Diplomacy, Culture Change, Circumpolar Peoples, South and Southeast Asia, Middle East

Scott L. H. Madry (65), Spatial Analysis, Remote Sensing, Geographic Information Systems, Global Positioning System, Modeling, Old World Prehistory

Lecturer

Charles Haines, South Asia, Muslim World, Globalization

Professors Emeriti

Donald L. Brockington, Archaeology, Latin America, Middle America

John Gulick, Social Organization, Sex Roles and Identities, Fertility Behavior, Urban Cultures, Middle East

Richard A. Yarnell, Ecology, Evolution, Ethnobotany, North America

The Department of Anthropology offers advanced work leading to the master of arts and doctor of philosophy degrees. Students admitted into the graduate program are admitted for the Ph.D. degree. A master's degree may be taken as part of the program leading to the Ph.D. degree; however, a master's degree is not an essential part of the doctoral program.

Incoming graduate students are required to complete two core courses in the fall semester—Sociocultural Theory and Ethnography (ANTH 701) and Evolution and Ecology (ANTH 703)—and a choice of two of three core courses in the spring semester—Sociocultural Theory and Ethnography (ANTH 702), Evolution and Ecology (ANTH 704) or Archaeological Theory (ANTH 705). Remaining courses are selected from a list of concentration courses, field research courses, and professional preparation courses. Students are expected to take at least three courses from within their chosen area of concentration or from a set of courses designated by the Program in Medical Anthropology or the Program in Archaeology.

The Ph.D. degree requires specialization in a defined area of study and the completion of an acceptable dissertation treating some problem within this area. The Ph.D. program is quite flexible; any area and problem can be selected for study, provided they meet the approval of the adviser, the Ph.D. committee and the faculty. Part of the training of a professional anthropologist in many circumstances should include undertaking research within a culture significantly different from the candidate's own, although the department is increasingly open to 'native' or indigenous anthropology carried out critically in one's own cultural setting.

Graduate students may, in accordance with the regulations of The Graduate School, take courses offered by other departments or neighboring universities. Courses in anatomy, biology, ecology, epidemiology, folklore, history, cultural studies, genetics, geography, linguistics, philosophy, psychology or sociology are often particularly appropriate. Departmental policy is to help the student select courses that supplement and strengthen the specialization in anthropology.

The Department of Anthropology works closely with the Curriculum in Ecology, the Odum Institute for Research in Social Science, the Curriculum of International Studies, the Center for Global Initiatives, the Institute for the Study of the Americas, the Carolina Population Center, the University Program in Cultural Studies and the Research Laboratories of Archaeology, and has various active training and research interests in conjunction with other departments and schools of the University.

Up-to-date lists of Anthropology faculty and courses, along with additional information about the graduate program, faculty research projects, and other information, are available on the department's Web site: anthropology.unc.edu.

Courses for Graduates and Advanced Undergraduates

400 [179] INTRODUCTION TO GENERAL LINGUISTICS (LING 400) (3). An introduction to the scientific study of language. The nature of language structure. How languages are alike and how they differ.

411 [111] LABORATORY METHODS IN ARCHAEOLOGY (3). An examination of the laboratory techniques used by archaeologists to analyze artifacts and organic remains, including the analysis of stone tools, pottery, botanical remains and bone. Billman, Scarry, Tomaskova.

412 [112] PALEOANTHROPOLOGY (3). This course traces the evolution of humans and nonhuman primates—including behaviors, tools and bodies of monkeys, apes and human hunters and gatherers—evolutionary theory and paleoanthropological methods. Hutchinson.

413 [111A] ARCHAEOBOTANY LAB METHODS (3). Prerequisite, any course in archaeology or permission of the instructor. Scarry.

413L ARCHAEOBOTANY LAB (1). Prerequisite, any course in archaeology or permission of the instructor. This is a required one-hour laboratory section to be taken in conjunction with ANTH 413. Scarry.

414 LABORATORY METHODS: HUMAN OSTEOLOGY (3). This course will focus on the analysis of human skeletal materials in the laboratory and in the field, with an emphasis on basic identification, age and sex estimation, and quantitative analysis. Hutchinson.

414L HUMAN OSTEOLOGY LAB (1). Must be taken concurrently with ANTH 414. The laboratory analysis of human skeletal materials with an emphasis on basic identification, age and sex estimation, and quantitative analysis. Hutchinson.

415 [111B] ZOOARCHAEOLOGY (3). This course will focus on the analysis of animal remains from archaeological sites. Introduction to laboratory methods, analytical approaches, and interpretive frameworks for zooarchaeology. Hutchinson.

415L ZOOARCHAEOLOGY LAB (1). Prerequisite, an archaeological course or permission of instructor; corequisite, ANTH 415. Examination of identification techniques, quantitative methods, and interpretive frameworks used to analyze animal remains recovered from archaeological sites. Hutchinson.

416 [116] BIOARCHAEOLOGY (3). The study of human skeletal remains from archaeological contexts. The collection and interpretation of quantitative and qualitative data is emphasized to assess the relationship between past biology, environment, culture and behavior. Hutchinson.

417 [111C] LABORATORY METHODS: LITHIC SEMINAR (3). Laboratory techniques in stone tool research and experimental practice. Tomaskova.

417L LITHIC ANALYSIS LAB (1). Prerequisite, any course in archaeology or permission of instructor. This is a required one-hour laboratory section to be taken in conjunction with ANTH 417. Tomaskova.

418 LABORATORY METHODS: CERAMIC ANALYSIS (3). A survey of the laboratory techniques used by archaeologists to study and draw social and behavioral inferences from ancient pottery. Steponaitis.

421 [102] ARCHAEOLOGICAL GEOLOGY (GEOL 421) (3). Permission of the instructor. The application of geological principles and techniques to the solution of archaeological problems. Geological processes and deposits pertinent to archaeological sites, geological framework of archaeology in the southeastern United States, and techniques of archaeological geology and site analysis are studied. Field trips to three or more sites are conducted; written reports on geological aspects of the sites required.

422 [322] ANTHROPOLOGY AND HUMAN RIGHTS. An examination of human rights issues from an anthropological perspective, addressing the historical formation of rights, their crosscultural contest and the emergence of humanitarian and human rights organizations on a global scale.

428 [142] RELIGION AND ANTHROPOLOGY (FOLK 428, RELI 428) (3). Religion studied anthropologically as a cultural, social and psychological phenomenon in the works of classical and contemporary social thought. Peacock.

428H [142H] RELIGION AND ANTHROPOLOGY (3). Religion studied anthropologically as a cultural, social and psychological phenomenon, in the works of classical and contemporary social thought.

429 [129] CULTURE AND POWER IN SOUTHEAST ASIA (ASIA 429, FOLK 429) (3). The formation and transformation of values, identities and expressive forms in Southeast Asia in response to forms of power. Emphasis on the impact of colonialism, the nation-state and globalization. Wiener.

435 [135] CONSCIOUSNESS AND SYMBOLS (CMPL 435, FOLK 435) (3). This course explores consciousness through symbols. Symbols from religion, art, politics and self are studied in social, psychological, historical and ecological context to ascertain meanings in experience and behavior. Peacock.

436 [187] GENDER AND SCIENCE (WMST 436) (3). Feminist approaches to science; history of scientific constructions of male and female nature, and theoretical approaches to the role of gender in science.

437 EVOLUTIONARY MEDICINE (3). This course explores evolutionary dimensions of variation in health and disease in human populations. Topics include biocultural and evolutionary models for the emergence of infectious and chronic diseases and cancers. Tomaskova.

438 [138] RELIGION, NATURE, AND ENVIRONMENT (RELI 438) (3). A seminar on concepts of nature within religions and a variety of worldwide spiritual traditions. Emphasis on sacred space, place and pilgrimage as a vital intersection of religion and nature. Johnson.

438H [138H] CONCEPTS OF NATURE (RELI 438H) (3). An interdisciplinary seminar exploring conceptions of nature within selected sociocultural traditions. Emphasis on aspects of nature such as water, trees and forests, fractal patterns and celestial phenomena such as stars. Johnson.

439 POLITICAL ECOLOGY (3). Examines environmental degradation, hunger and poverty through the lens of power relationships, particularly inequality, political and economic disenfranchisement, and discrimination. Discussion of global case studies, with a Latin American focus.

440 [140] GENDER AND CULTURE (WMST 440) (3). Crosscultural comparison of gender roles through the life of a person, comparison to students' own experiences. Discussion of changing sex and gender roles through history in different cultures.

441 [141] THE ANTHROPOLOGY OF GENDER, HEALTH AND ILLNESS (WMST 441) (3). The course explores cultural beliefs, practices and social conditions that influence health and sickness of women and men from a crosscultural perspective. Finkler.

442 HEALTH AND GENDER AFTER SOCIALISM (3). This course examines postsocialist experiences of the relationship between political, economic, social and cultural transitions, and challenges in public health and gender relations.

443 CULTURES AND POLITICS OF REPRODUCTION (3). This course takes a crosscultural approach to understanding how reproduction and associated phenomena become arenas where political debates get played out, and where global and local social relations get contested.

444 MEDICINE, POLITICS AND JUSTICE (3). This course brings an anthropological approach to understanding the intersections between medicine, politics and public health.

447 [147] THE ANTHROPOLOGY OF WORK (3). Anthropological investigations of work and the relationship between work, family life and community in contemporary societies in the United States, Asia and Latin America, within the framework of globalization. Nonini.

447H [147H] ANTHROPOLOGY OF WORK (3). Anthropological investigations of work and the relationship between work, family life and community in contemporary societies in the United States, Asia and Latin America, within the framework of globalization. Nonini.

449 [149] ANTHROPOLOGY AND MARXISM (3). Critical study of Marx's mature social theory and its relationship to contemporary anthropology. Nonini.

450 [150] ARCHAEOLOGY OF NORTH AMERICAN INDIANS (3). The history of American Indian cultures from 10,000 BCE to the time of the Euro-

pean colonization as reconstructed by archaeological research. Special emphasis on the eastern and southwestern United States.

451 [151] FIELD SCHOOL IN NORTH AMERICAN ARCHAEOLOGY (6). Intensive training in archaeological field methods and techniques. Students participate in the excavation, recovery, recording and interpretation of archaeological remains. Instruction given in survey, mapping, photography, flotation recovery, etc. V. Steponaitis.

452 [052] THE PAST IN THE PRESENT (3). Memory and history, history and politics, national narratives, the past in the present, and the present in the past; a crosscultural examination of ways of connecting the present and the past.

453 [153] FIELD SCHOOL IN SOUTH AMERICAN ARCHAEOLOGY (6). Intensive study of archaeological field and laboratory methods and prehistory of the Andes through excavation and analysis of materials from archaeological sites in Peru. Includes tours of major archaeological sites. Summer. Billman.

455 [155] ETHNOHISTORY (FOLK 455) (3). Integration of data from ethnographic and archaeological research with pertinent historic information. Familiarization with a wide range of sources for ethnohistoric data and practice in obtaining and evaluating information. Pertinent theoretical concepts will be explored. Crumley.

456 [156] ARCHAEOLOGY AND ETHNOGRAPHY OF SMALL-SCALE SOCIETIES (3). The study of small-scale hunter-gatherer and farming societies from archaeological and ethnographic perspectives. Methods and theories for investigating economic, ecological and social relations in such societies are explored. Scarry.

458 [158] ARCHAEOLOGY OF SEX AND GENDER (WMST 458) (3). A discussion of gender and sex roles and sexuality in past cultures; a crosscultural examination of ways of knowing about past human behavior. Scarry.

459 [139] ECOLOGICAL ANTHROPOLOGY. Examines how human-environmental adaptations shape the economic, social and cultural lives of hunter-gatherers, pastoralists and agriculturalists. Approaches include optimal foraging theory, political ecology and subsistence risk.

460 [160] HISTORICAL ECOLOGY (ENST 460) (3). Historical ecology is a framework for integrating physical, biological and social science data with insights from the humanities to understand the reciprocal relationship between human activity and the Earth system. Crumley.

462 ANTHROPOLOGY OF SPACE AND POWER (3). Crosscultural investigation of the relationships between space, power and representations in modern urban life. Draws on different sources to examine the cultural politics of built forms, architecture and urban planning. Nonini.

465 [165] ECONOMIC ANTHROPOLOGY (3). A comparative exploration through ethnographic and other social science sources of the sociocultural constitution of economic practices, including but not limited to exchange, production and consumption of commodities in modern capitalist societies.

466 ALTERNATIVE ECONOMIC SYSTEMS (3). An investigation of economic systems that are sustainable alternatives to the prevailing economic order. Topics include markets, the commons, cooperatives, local trading systems and social movements working to achieve alternatives.

468 [168] STATE FORMATION (3). The course examines the state, from its initial appearance 5,000 years ago to newly established nation-states, exploring the concepts of ethnicity, class, race and history in state formation and maintenance. Crumley, Nonini.

469 [169] HISTORY AND ANTHROPOLOGY (3). Studies links between history and anthropology, cultures in historical perspective and history in cultural perspective, and effects of relations of power and historical interconnections on the peoples of the world. Redfield, Wiener.

470 [170] MEDICINE AND ANTHROPOLOGY (FOLK 470) (3). This course examines cultural understandings of health, illness and medical systems from an anthropological perspective with a special focus on Western medicine. Finkler.

472 [172] REFUGEES AND EXILE (3). This anthropological exploration of refugees and forced migration addresses displacement across national borders, local repercussions and the influence of the lived experience of exile on displaced people's identity.

473 [173] ANTHROPOLOGY OF THE BODY AND THE SUBJECT (FOLK 473) (3). Anthropological and historical studies of cultural constructions of bodily experience and subjectivity are reviewed, with emphasis on the genesis of the modern individual and cultural approaches to gender and sexuality.

484 [184] DISCOURSE AND DIALOGUE IN ETHNOGRAPHIC RESEARCH (FOLK 484, LING 484) (3). Study of cultural variation in styles of speaking applied to collection of ethnographic data. Talk as responsive social action and its role in the constitution of ethnic and gender identities. Holland.

485 [146] INTRODUCTION TO FOLKLORE (ENGL 485, FOLK 485) (3). An introduction to the study of creativity and aesthetic expression in everyday life, considering both traditional genres and contemporary innovations in the material, verbal and musical arts.

491 [191] POLITICAL ANTHROPOLOGY (3). Introduction to political anthropology. A thematically organized investigation of political processes in state societies, including state formation, with special attention to ethnographic and historical approaches. Nonini.

499 EXPERIMENTAL COURSE IN ANTHROPOLOGY IV (3). Examines selected topics from an anthropological perspective, generally to explore the potential for a course. Course description is available from the departmental office.

499H EXPERIMENTAL COURSE IN ANTHROPOLOGY IV (3). Examines selected topics from an anthropological perspective, generally to explore the potential for a course. Course description is available from the departmental office.

502 GLOBALIZATION AND TRANSNATIONALISM (3). Anthropological examination of processes of globalization and transnationalism, with special attention to transnational migration, emergence of transnational ("global") institutions, commodity flows, and dissemination of ideologies, cultural frameworks and media imagery. Nonini.

520 [180] LINGUISTIC PHONETICS (LING 520) (3). Introduction to the general principles of linguistic phonetics; anatomy of vocal tract, physiology of speech production, universal phonetic theory. Practice in the recognition and transcription of speech sounds.

523 PHONOLOGICAL THEORY I (LING 523) (3). Prerequisite, LING 521 or equivalent. Introduction to the principles of modern generative phonology. Methods and theory of phonological analysis. Not normally open to those who have taken LING 200, unless permission of the instructor is given.

525 [121] CULTURE AND PERSONALITY (FOLK 525) (3). Systems theory used to conceptualize relationship between cultural patterns and individual minds. Functional, dysfunctional and therapeutic processes considered. Examples from Africa, Asia, Europe and Native America. Lectures, films, recitations. Daniels.

537 [137] GENDER IN PRACTICE (FOLK 537, WMST 438) (3). A study of the ways in which individuals constitute themselves as gendered subjects in the contemporary context of economic and cultural globalization. Sawin.

539 ENVIRONMENTAL JUSTICE (3). Course examining issues of race, poverty and equity in the environmental movement. Cases include the citing of toxic incinerators in predominantly people-of-color communities to resource exploitation on indigenous lands.

541 [171] SOCIOLINGUISTICS (LING 541) (3). Prerequisite, LING 101, 400, or permission of the instructor. Introduction to the study of language in relation to society; variation as it correlates with socioeconomic status, region, gender; the social motivation of change; language and equality; language maintenance, planning, shift.

542 [192] PIDGINS AND CREOLES (GERM 542, LING 542) (3). Prerequisite, LING 101, 101H, or equivalent, or permission of the instructor. Examination of the linguistic features of pidgin and Creole languages, the sociohistorical context of their development, and their import for current theoretical issues (acquisition, universals, language change). Roberge.

545 [145] THE POLITICS OF CULTURE IN EAST ASIA (ASIA 545) (3). Examines struggles to define culture and the nation in 20th-century China in domains like popular culture, museums, traditional medicine, fiction film, ethnic group politics, and biography and autobiography.

559 HISTORY IN PERSON (3). Extends anthropological approaches to identity in social life. Examines social position, power and cultural imagination; the personal and collective dynamics of sociocultural change; and the concept of agency.

567 [167] URBAN ANTHROPOLOGY (3). Comparative study of the political economy and cultural politics of populations in spaces and landscapes in cities in America and Third World undergoing globalization, economic restructuring and transnational immigration.

574 [174] CHINESE WORLD VIEWS (ASIA 574, RELI 574) (3). Explores the indigenous Chinese sciences and the cosmological ideas that informed them. Topics include astronomy, divination, medicine, fengshui, and political and literary theory. Chinese sources in translation are emphasized.

578 [178] CHINESE DIASPORA IN THE ASIA PACIFIC (ASIA 578) (3). Examination of the histories, social organization and cultures of the Chinese Diasporas in the Asia Pacific region, focusing on contemporary issues in the cultural politics and identities of "overseas Chinese." Nonini.

581 [181] HISTORICAL AND COMPARATIVE LINGUISTICS (3). Theories and methods of historical and comparative linguistics, with emphasis upon the Indo-European family.

585 [185] ANTHROPOLOGY OF SCIENCE (3). Cultural perspectives on science and technology at a global scale, including research settings and social contexts, knowledge claims and material practice, and relations between scientific worldviews, social institutions and popular imagination.

586 [196] THE GARDENS, SHRINES AND TEMPLES OF JAPAN (ASIA 586) (3). The religious landscape and built environments of Japan. Attention to palace, courtyard and teahouse architecture and gardens, with emphasis on Shinto shrines and the Zen Buddhist temple and garden. Johnson.

599 EXPERIMENTAL COURSE IN ANTHROPOLOGY V (3). Examines selected topics from an anthropological perspective, generally to explore the potential for a course. Course description is available from the departmental office.

626 AFRICAN CULTURAL DYNAMICS (3). In-depth reading of several books and articles that consider the interaction between indigenous African traditions and intrusive colonial and postcolonial forces. Emphasis on class discussion. Short papers and individual projects. Daniels.

629 [189] LANGUAGE MINORITY STUDENTS: ISSUES FOR PRACTITIONERS (EDUC 629) (3). Prerequisite, permission of the instructor. Explores issues of culture and language associated with teaching English as a second language. Kubota, Villalva.

639 BEYOND THE TRAGEDY OF THE COMMONS (3). Reexamination of the "tragedy of the commons" concept in light of recent work on environmental problems, property rights and community-based conservation. Case studies include fishery, waterway, forest and pasture management.

660 [166] KINSHIP, REPRODUCTION, REPRODUCTIVE TECHNOLOGY AND THE NEW GENETICS (WMST 660) (3). This course focuses on the relationship between family, kinship, new reproductive technologies, and the new genetics from a crosscultural perspective. Finkler.

660H [166H] (3). KINSHIP AND REPRODUCTION (WMST 660H) (3). This course focuses on the relationship between family, kinship, new reproductive technologies and the new genetics from a crosscultural perspective.

675 [175] ETHNOGRAPHIC METHOD (FOLK 675) (3). Intensive study and practice of the core research methods of cultural and social anthropology.

682 [182] CONTEMPORARY CHINESE SOCIETY (ASIA 682) (3). Presents recent anthropological research on the People's Republic of China. in addition to social sciences sources, fictional genres are used to explore the particular modernity of Chinese society and culture.

686 [186] SCHOOLING AND DIVERSITY: ANTHROPOLOGICAL PERSPECTIVES (3). Anthropological approaches to schooling and cultural diversity in the United States, including their relationship to gender, race and class. Critical review of research on responses to diversity. Holland.

688 [188] OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (FOLK 688, RELI 688) (3). Permission of the instructor. Exercises (including field work) in learning to read the primary modes of public action in religious traditions—e.g., sermons, testimonies, rituals and prayers. Peacock.

691H [095] SENIORS HONORS PROJECT IN ANTHROPOLOGY (3). Open only to honors candidates. Permission of the instructor is required.

692H [096] SENIOR HONORS THESIS IN ANTHROPOLOGY (3). Open only to senior honors candidates. Permission of the instructor is required.

693H SENIOR HONORS THESIS IN ANTHROPOLOGY II (3). Open only to honors candidates. Permission of the instructor is required. Writing of an honors thesis based on independent research under the direction of a faculty member of the department.

694H SENIOR HONORS THESIS IN ANTHROPOLOGY III (3). Open only to honors candidates. Permission of the instructor is required. Writing of an honors thesis based on independent research under the direction of a faculty member of the department.

695H SENIOR HONORS THESIS IN ANTHROPOLOGY IV (3). Open only to honors candidates. Permission of the instructor is required. Writing of an honors thesis based on independent research under the direction of a faculty member of the department.

697 [197] ETHNOGRAPHY AND CULTURE AFTER EMPIRE (3). Examination of cultural anthropology's relations to global power, past and present. Critiques and revisions of key concepts (e.g., culture) and forms of knowledge (ethnography). Wiener.

699 EXPERIMENTAL COURSE IN ANTHROPOLOGY VI (3). Examines selected topics from an anthropological perspective, generally to explore the potential for a course. Course description is available from the departmental office.

Courses for Graduates

700 [200] ADVANCED SURVEY OF ANTHROPOLOGY (3). Course description is available from the departmental office.

701 [201] THEORY AND ETHNOGRAPHY (3). Prerequisite, permission of the instructor. Development of a critical understanding of the anthropological study of society and culture through discussion of problems and issues expressed in classic theoretical and ethnographic literature.

702 [202] SOCIOCULTURAL THEORY AND ETHNOGRAPHY (3). Prerequisite, ANTH 701 or permission of the instructor.

703 [203] EVOLUTION AND ECOLOGY (3). Prerequisite, permission of the instructor. Development of a critical understanding of anthropological approaches to evolution and ecology in paleontological, archaeological, and present-day crosscultural contexts through the historical and comparative study of theory, method, and content.

704 [204] EVOLUTION AND ECOLOGY (3). Prerequisite, ANTH 703 or permission of the instructor. Continuation of topics covered in 703, with an emphasis on ecological and evolutionary perspectives on contemporary human biology and behavior.

705 [205] ARCHAEOLOGICAL THEORY (3). Review of the recent history of archaeology and contemporary approaches to archaeological interpretation.

710 [210] WRITING AND PUBLISHING IN ANTHROPOLOGY (3). A seminar on the peer review and analysis of student writing. Training in writing for academic publication.

715 [215] FEMINISM AND SOCIETY (WMST 715) (3). Selected topics in feminist analysis of social life, with materials drawn from a global range of societies.

717 [217] ADVANCED STUDIES IN ART AND ARCHITECTURE (3). Prerequisites, ANTH 334 (FOLK 334) or permission of the instructor. Intensive study of selected topics and issues in the analysis and interpretation of prehistoric and crosscultural art, architecture and other aesthetic forms. Johnson.

723 [223] SEMINAR IN ANTHROPOLOGICAL LINGUISTICS (LING 723) (3). Selected topics from general linguistics and sociolinguistics, special emphasis on methods and problems involved in analysis and description of semantic structure of language and its relation to the rest of culture. Holland.

724 [224] SEMINAR IN ANTHROPOLOGY AND CYBERNETICS (3). Examination of systems theory, or cybernetics; evaluation of previous applications of cybernetic models in anthropology; and original analysis of anthropological data in these terms by students. Daniels.

725 [225] QUANTITATIVE METHODS IN ANTHROPOLOGY (3). Survey of standardized data-gathering techniques, problems in research design and methods of quantitative analysis encountered in anthropological research. Holland.

726 [226] QUANTITATIVE METHODS IN ARCHAEOLOGY (3). Introduction to quantitative and computer methods in archaeology. The course stresses exploratory data analysis and graphical pattern recognition techniques. V. Steponaitis.

727 ARCHAEOLOGY OF NORTH AMERICA (3). The history of American Indian cultures from 10,000 BC to the time of the European colonization as reconstructed by archaeological research. Special emphasis on the eastern and southwestern United States. V. Steponaitis.

728 SEMINAR IN AMERICAN ARCHAEOLOGY (3). This seminar covers current research topics in North American archaeology, with an emphasis on the eastern or southwestern United States. Specific topics may vary from year to year. V. Steponaitis.

733 [233] ADVANCED SEMINAR IN CARIBBEAN STUDIES (3). Prerequisite, permission of the instructor. Survey of Caribbean cultural development for students with some knowledge or experience in the area. Particular attention is given to current problems and recent theoretical issues.

740 [240] POWER (3). Theories of power within anthropology, from Marxism, poststructuralism, feminist studies, studies in race relations, cultural studies, others. Nonini.

744 [244] SEMINAR IN ETHNICITY AND CULTURAL BOUNDARIES (3). Investigation of recent theoretical approaches to ethnic phenomena; consideration of cases ranging from tribal organization to complex industrial nations; analysis of particular ethnographic and ethnohistorical situations by individual students. Daniels.

749 [249] CULTURAL PRODUCTION (3). Critical examination of theories of social and cultural (re)production (e.g., Bourdieu's practice theory, cultural studies and resistance theory) applied to enduring issues (e.g., the relations between power and gender, race and class). Holland.

750 [250] SEMINAR IN MEDICAL ANTHROPOLOGY (3). Specially designed for, but not restricted to, students who are specializing in medical anthropology. Medicine as part of culture; medicine and social structure viewed crossculturally; medicine in the perspective of anthropological theory; research methods. A special purpose is to help students plan their own research projects, theses and dissertations. Finkler.

751 [251] SEMINAR ON THE ANTHROPOLOGICAL CONTRIBUTION TO THE UNDERSTANDING OF MEDICAL SYSTEMS (3). Anthropological contributions to the understanding of medical systems, sickness and public health. Attention is given to the ways in which medical anthropology illuminates social processes, beliefs and ideologies. Finkler.

752 [252] TRANSCULTURAL PSYCHIATRY (3). Prerequisite, ANTH 470, 525 or permission of the instructor. Considers crosscultural variations in the perception, definition of, and reaction to course and treatment of deviant behavior—especially mental disorders.

753 [253] GENDER, SICKNESS AND SOCIETY (WMST 753) (3). This seminar deals in-depth and crossculturally with the nature of gender and the ways in which social comprehension of gender, gender status and gender relationships impinge upon differential experience of health and sickness of men and women from a historical and contemporary perspective. Finkler.

754 [254] PHENOMENOLOGICAL ANTHROPOLOGY (3). Prerequisite, permission of the instructor. The course aims to apply the theories and methods of phenomenology to the practice of anthropology. Evens.

755 [255] SEMINAR IN ECOLOGY AND POPULATION (3). Mutual relationships of environment, social structure, mortality and natality, reviewed in an evolutionary framework. Leslie.

756 [256] THE EVOLUTION OF HUMAN COGNITION (3). Prerequisite, permission of the instructor. A critical exploration of contemporary evidence on the evolution of human cognition and consciousness, including phylogenetic, comparative (interspecific), ontogenetic and crosscultural perspectives. Holland.

759 [259] IDENTITY AND AGENCY (3). Sociogenic theories of identity, agency and human consciousness—the works of Mikhail Bakhtin, Pierre Bourdieu and others—examined ethnographically and crossculturally in selected fields of social activity. Holland.

760 [260] SEMINAR IN HUMAN EVOLUTIONARY ECOLOGY (3). Prerequisite for undergraduates, permission of the instructor. Examination of evolutionary ecology concepts with existing or potential uses in human adaptation research including adaptation and optimization, effective environmental properties, foraging strategies, niche, competitive exclusion, life history tactics and biogeography.

765 [265] SEMINAR IN THE ANTHROPOLOGY OF LAW (3). Prerequisite, permission of the instructor. Drawing upon recent work of social anthropologists, this course analyzes the nature of law and conceptions of authority in various Asian, African and American preliterate societies. The course relates law with the economy, social organization, religious ideology and political instruments of each society. Underlying theories of social cohesion and process are examined in detail. Conley.

766 [266] SEMINAR IN ETHNOBOTANY (3). Prerequisite, permission of the instructor. The focus is on economic plants and primitive technology, ecological relationships between man and plants, and analysis and interpretation of archaeological plant remains. Some laboratory work is expected. Scarry.

770 [270] SEMINAR ON ANTHROPOLOGICAL PERSPECTIVES ON LATIN AMERICA (3). The seminar focuses on the interaction of five major issues in Latin America: class, ethnicity, gender, religion and health. Finkler.

788 [288] OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (3). Explores religious action through field work as a way of studying method and theory. Peacock.

790 [290] DIALECTOLOGY (LING 790) (3). Principles and methods of areal linguistics and social dialectology. (On demand.)

793 [293] LINGUISTIC FIELD WORK I (LING 793) (3). Analysis and description of a language unknown to the class from data solicited from a native informant. (Alternate years.)

794 [294] LINGUISTIC FIELD WORK II (LING 794) (3).

809 ETHNOGRAPHIC METHODS (3).

810 [310] SEMINAR IN THE ANTHROPOLOGY OF MEANING (1). Ongoing seminar for students and faculty participating in the Anthropology of Meaning concentration.

817 [317] THE CONCEPT OF TEACHING OF GENERAL ANTHROPOLOGY (3). Prerequisite, permission of the associate chair. Directed course preparation and review of teaching techniques, films and other aids.

818 [318] TRAINING IN THE TEACHING OF ANTHROPOLOGY (3). Prerequisites, ANTH 817 and permission of the associate chair. The trainee teaches a small class in general anthropology under supervision.

860 [297] ART OF ETHNOGRAPHY (FOLK 860) (3). A field-based exploration of the pragmatic, ethical and theoretical dimensions of ethnographic research, addressing issues of experience, aesthetics and worldview through the lens of cultural encounter. Field research is required. Hinson.

897 [327] SEMINAR IN SELECTED TOPICS (1–4).

898 [328] SEMINAR IN SELECTED TOPICS (1–4).

901 [301] READING AND RESEARCH (1–4). Registration with permission of professor.

902 [302] READING AND RESEARCH (1–4). Registration with permission of professor.

915 [315] READING AND RESEARCH IN METHODOLOGY (1–4). Registration with permission of professor.

916 [316] READING AND RESEARCH IN METHODOLOGY (1–4). Registration with permission of professor.

921 [321] FIELD RESEARCH (3). Registration with permission of the professor.

922 [322] FIELD RESEARCH (3). Registration with permission of the professor.

993 [393] MASTER'S THESIS (3 or more). Individual research in a special field under the direction of a member of the department.

994 [394] DOCTORAL DISSERTATION (3 or more). Individual research in a special field under the direction of a member of the department.

Curriculum in Applied Sciences And Engineering

www.unc.edu/depts/appl_sci

LAURIE MCNEIL, *Interim Chair*
Lu-Chang Qin, *Associate Chair for Graduate Studies*
Richard Goldberg, *Associate Chair for Undergraduate Studies*

Professors

A. J. Banes (Orthopaedics) Cytomechanics, Cell-Cell Communication, Matrix Proteins
Maurice Brookhart (Chemistry) Synthetic, Mechanistic and Structural Organometallic Chemistry; Synthesis of Highly Electrophilic Metal Carbene Complexes and Use of Transition Metal Complexes for C-H Bond Activation
Joseph M. DeSimone (Chemistry) Polymeric Materials Synthesis
Dorothy Erie (Chemistry) Physical and Biological Chemistry, Structure and Function of Transcription Processes
Greg Forest (Mathematics) Flow and Structure of Complex Polymeric Fluids, Weakly Compressible Transport Phenomena, Solitons and Optical Fiber Applications, Inverse Problems for Material Characterization, Modeling of Transport in Multiphase Porous Media.
Eugene Irene (Chemistry) Ultra-thin Films, Interfaces, Surfaces and Devices for Microelectronics
Stephen Knisley (Biomedical Engineering) Electrophysiology and Biophotonics
Barry Lentz (Biochemistry and Biophysics) Biomembrane Structural Features in the Role of Platelet Membranes in Blood Coagulation and the Involvement of Bilayer Microstructures in Cell Membrane Fusion
Jianping Lu (Physics and Astronomy) Theoretical Studies of Materials
Laurie E. McNeil (Physics and Astronomy) Structure-Property Relations, Optical Spectroscopy
Royce W. Murray (Chemistry) Electron Transfer Active Polymers, Metal Clusters
Michael Rubinstein (Chemistry) Molecular Models of Polymers
Edward T. Samulski (Chemistry) Liquid Crystals and Liquid Crystal Polymers
Richard Superfine (Physics and Astronomy) Interfacial Ordering of Molecules
Sean Washburn (Physics and Astronomy) Quantum Transport, Mechanical and Electrical Response.
Yue Wu (Physics and Astronomy) Quasicrystals, Nanocrystals, Nanotubes and Molecular Motion in Polymers
Otto Zhou (Physics and Astronomy) Synthesis, Properties and Applications of Nanomaterials

Associate Professors

Robert G. Dennis (Biomedical Engineering) Tissue Mechanics, Biomechanics, Functional Tissue Engineering
Michael Falvo (Physics and Astronomy) Mechanics and Friction of Nanoscale Materials, Nanoscale Electromechanical Systems (NEMS), Scanning Probe Microscopy and Nanomanipulation Forces and Mechanics of Nanobiological Systems
Charles Finley (Biomedical Engineering) Design and Optimization of Speech Processor and Electrode Systems Used in Cochlear Implants
Richard Goldberg (Biomedical Engineering) Assistive Technology Devices for People with Disabilities
Wenbin Lin (Chemistry) Nonlinear Optical, Supramolecular and Chiral Porous Materials, Asymmetric Catalysis, Chiral Sensing and Separations
Nalin Parikh (Physics and Astronomy) Ion Beam Modifications and Analysis
Lu-Chang Qin (Physics and Astronomy) Synthesis and Structure of Nanomaterials
Sergei S. Sheiko (Chemistry) Dynamics of Single Molecule on a Surface
Russell Taylor (Computer Science) Advanced Computer Graphics, Data Rendering, Novel Microscopy Instrumentation
Alex Tropsha (Medicinal Chemistry) Biomolecular Informatics, Relationships Between Chemical Structures and Their Functional Properties
Frank Tsui (Physics and Astronomy) Synthesis of Artificially Structured Materials
Paul Weinhold (Orthopaedics) Orthopaedic Biomechanics, Vibration Testing of Orthopaedic Tissues and Constructs

The Materials Science program at the University of North Carolina at Chapel Hill is an interdisciplinary graduate program that brings together faculty from physics and astronomy, chemistry and various departments in the health sciences (including dentistry, orthopedics and biomedical engineering) to engage in research and training in materials science. The primary areas of emphasis in the program are electronic, nano, polymer and biomaterials. Students pursuing M.S. and Ph.D. degrees in materials science begin their studies with a core curriculum covering the fundamentals of materials, including their structures, surfaces, fabrication, thermodynamics and materials science laboratory techniques. They continue with elective courses offered by the curriculum or the participating departments as appropriate to their area of research concentration. Graduate students engage in research under the supervision of one of the participating materials science faculty in the Curriculum in Applied Sciences and Engineering.

Research Interests

The four areas of research emphasized in the Materials Science program are electronic, nano, polymer and biomaterials. These four areas are not discrete, however, as research projects in electronic polymers, nonlinear optics of polypeptides on surfaces, liquid crystals and wear in polyethylene artificial joints demonstrate. Individual faculty members may have research interests in more than one of the primary areas, and may collaborate with others to address all four. For detailed information, please contact the curriculum office at (919) 962-6293, or e-mail cnewman@email.unc.edu.

Degree Requirements

The Ph.D. degree requirements include completion of a suitable set of courses, cumulative written comprehensive exams, a preliminary doctoral oral exam, an original research project culminating in a dissertation, and a final oral exam. The M.S. degree requirements include completion of a suitable set of courses, cumulative written comprehensive exams, a research project and a final oral exam. The general regulations of The Graduate School govern credit hour, residency and examination requirements.

Courses

All students must pass the following courses, or must have passed their equivalents elsewhere: APPL 470, APPL 473, and MTSC 615, 720, 730 and 735. Each student also takes additional courses offered by the curriculum or participating departments, as appropriate for his or her area of study.

Comprehensive Exam

M.S. students must pass three core exams and one specialty exam. Ph.D. students must pass four core exams and two specialty comprehensive exams. Topics for the specialty exams will be research areas represented in the Materials Science program at UNC-Chapel Hill; core exams cover the fundamental knowledge of materials science. All students are required to complete the comprehensive exam by the second year.

Preliminary Doctoral Oral Exam

Students are required to select a research adviser and a thesis committee during the first year in graduate school. To pass the preliminary doctoral oral exam, students must present and successfully defend their Ph.D. research proposal to the thesis committee by the end of the second year.

Facilities and Equipment

Students and faculty in the curriculum have access to the following central facilities located in various departments: NMR (2), computer modeling and computer graphics, confocal microscopy, electron microscopy, glass shop, machine shop (2), laser lab, mechanical testing, mass spectroscopy and x-ray diffraction. In addition, a variety of equipment is located in individual research laboratories. This includes equipment for thermal analysis; polymer synthesis; FTIR, UV-Vis, Raman and photoluminescence spectroscopy; ellipsometry; CVD; MBE; thermal oxidation; AFM; RBS and ion channeling; electrical measurements; nonlinear optics; low temperatures and high pressures. Facilities at North Carolina State University in Raleigh and MCNC in Research Triangle Park are also available.

Fellowships and Assistantships

Teaching assistantships (with stipends of $16,560 for nine months) are available to qualified graduate students. The duties of assistants include teaching laboratory sections, assisting in the supervision of advanced laboratories, teaching recitation sections and grading papers. Summer support is generally available. Research assistantships are also offered.

Courses for Graduates and Advanced Undergraduates

APPL 341 [130] THERMODYNAMICS AND KINETICS APPLIED TO SOLIDS (3). Prerequisites, PHYS 117, MATH 383, APPL 150. The elements of thermodynamics and phenomenological kinetics of diffusion appropriate to solids are examined. Topics include equations of state, heat capacity, polyphase equilibria, phase transitions, diffusion and interfaces. Fall. Applied Sciences, Chemistry and Physics staff.

APPL 410 [101] SYSTEMS AND SIGNALS (BMME 410) (3). Prerequisites, PHYS 351 and permission of instructor. Analysis of linear systems by transform methods to networks, including stability analysis. Survey of numerical methods for network solutions.

APPL 420 [120] INTRODUCTION TO POLYMER CHEMISTRY (CHEM 420) (3). Prerequisite, CHEM 261 or 261H; pre- or corequisites, CHEM 262 or 262H, and 262L or 263L. Chemical structure and nomenclature of macromolecules, synthesis of polymers, characteristic polymer properties.

APPL 421 [121] SYNTHESIS OF POLYMERS (CHEM 421, MTSC 421) (3). Prerequisites, CHEM 251 and 262 or 262H. Synthesis and reactions of polymers; various polymerization techniques.

APPL 422 [122] PHYSICAL CHEMISTRY OF POLYMERS (CHEM 422, MTSC 422) (3). Prerequisites, CHEM 420 and 481. Polymerization and characterization of macromolecules in solution.

APPL 423 [123] INTERMEDIATE POLYMER CHEMISTRY (CHEM 423, MTSC 423) (3). Prerequisite, APPL 422. Polymer dynamics, networks and gels.

APPL 430 [103] DIGITAL SIGNAL PROCESSING I (BMME 430) (3). Prerequisite, COMP 101 or 116 or equivalent. This is an introduction to methods of automatic computation of specific relevance to biomedical problems. Sampling theory, analog-to-digital conversion and digital filtering will be explored in depth.

APPL 450 [105] LINEAR CONTROL THEORY (BMME 450) (4). Prerequisite, MATH 528 or equivalent. Linear control system analysis and design are presented. Frequency and time domain characteristics and stability are studied. These techniques are applied in an included laboratory.

APPL 460 [110] SURVEY OF ENGINEERING MATH APPLICATIONS (BMME 460) (1). Computational laboratory that surveys engineering math with emphasis on differential equations, and Laplace and Fourier analysis. Applications in biomedical engineering emphasized through problem set computation using Matlab. This course should be taken concurrently with MATH 528.

APPL 465 [111] BIOMEDICAL INSTRUMENTATION (BMME 465) (4). Prerequisite, PHYS 351. Topics include basic electronic circuit design, analysis of medical instrumentation circuits, physiologic transducers (pressure, flow, bioelectric, temperate and displacement). This course includes a laboratory where the student builds biomedical devices.

APPL 470 [141] FUNDAMENTALS OF MATERIALS SCIENCE (CHEM 470) (3). Prerequisites, APPL 341 and PHYS 321 or CHEM 482. Crystal geometry, diffusion in solids, mechanical properties of solids, electrical conduction in solids, thermal properties of materials, phase equilibria.

APPL 472 [142] CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (CHEM 472, MTSC 472, PHYS 472) (3). Prerequisites, CHEM 482 or PHYS 117 and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronics devices. Crystal growth, thin film deposition and etching and microlithography.

APPL 473 [143] CHEMISTRY AND PHYSICS OF SURFACES (CHEM 473, MTSC 473) (3). Prerequisite, APPL 470. The structural and energetic nature of surface states and sites, experimental surface measurements, reactions on surfaces including bonding to surfaces and adsorption, interfaces.

APPL 480 [119] MICROCONTROLLER APPLICATIONS I (3). Prerequisites, COMP 110 and PHYS 351. Introduction to digital computers for online, real-time processing and control of signals and systems. Programming analog and digital input and output devices is stressed. Case studies are used for software design strategies in real-time systems.

APPL 491L [144L] MATERIALS LABORATORY I (PHYS 491) (2). See PHYS 491 for description.

APPL 492L [145L] MATERIALS LABORATORY II (PHYS 492L) (2). Prerequisite, APPL 491L. Continuation of APPL 491L with emphasis on low- and high-temperature behavior, the physical and chemical behavior of lattice imperfections and amorphous materials and the nature of radiation damage.

APPL 510 [161] BIOMATERIALS (BMME 510) (3). Prerequisite, BMME 589 or one year of college-level biology. Chemical, physical engineering and biocompatibility aspects of materials, devices or systems for implantation in or interfacing with the body cells or tissues. Food and Drug Administration and legal aspects.

APPL 520L [124L] POLYMER CHEMISTRY LABORATORY (CHEM 520L) (2). See CHEM 520L for description.

MTSC 421 [121] SYNTHESIS OF POLYMERS (APPL 421) (CHEM 421) (3). Prerequisites, CHEM 251, 262 or 262H. Synthesis and reactions of polymers, various polymerization techniques. Fall. Chemistry faculty.

MTSC 422 [122] PHYSICAL CHEMISTRY OF POLYMERS (APPL 422, CHEM 422) (3). Prerequisites, CHEM 420 and 481. Polymerization and characterization of macromolecules in solution. Spring. Chemistry faculty.

MTSC 423 [123] INTERMEDIATE POLYMER CHEMISTRY (APPL 423, CHEM 423) (3). Prerequisite, CHEM 422. Polymer dynamics, networks and gels. Spring. Chemistry faculty.

MTSC 472 [142] CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (APPL 472, CHEM 470, PHYS 472) (3). Prerequisites, CHEM 482 or PHYS 117 and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronics devices. Crystal growth, thin film deposition and etching and microlithography. Spring. Chemistry and Physics faculty.

MTSC 473 [143] CHEMISTRY AND PHYSICS OF SURFACES (APPL 473, CHEM 473) (3). Prerequisite, CHEM 470. The structural and energetic nature of surface states and sites, experimental surface measurements, reactions on surfaces including bonding to surfaces and adsorption, interfaces. Spring. Chemistry and Physics faculty.

MTSC 573 [169] INTRODUCTORY SOLID STATE PHYSICS (PHYS 573) (3). Prerequisite, PHYS 321 or equivalent. Crystal symmetry, types of crystalline solids; electron and mechanical waves in crystals, electrical and magnetic properties of solids, semiconductors; low temperature phenomena; imperfections in nearly perfect crystals. Fall. Physics staff.

MTSC 615 [101] STRUCTURE AND PROPERTIES OF SOLIDS (3). Crystallography, reciprocal lattices, Bloch waves, band structure, electronic wave functions, phonons, thermal expansion. Superlattice structures, including liquid crystals. Overview of properties of ceramic, amorphous, polymeric and composite materials. Fall. Physics staff.

Courses for Graduates

MTSC 715 [215] VISUALIZATION IN SCIENCE (PHYS 715) (3). Prerequisite, graduate student or senior in computer science or natural science major. Computational visualization applied in the natural sciences. For both computer science and natural science students. Available techniques and their characteristics, based on human perception; using software visualization toolkits.

MTSC 720 [102] MATERIALS FABRICATION (3). Prerequisite, permission of the curriculum. Introduction of modern materials fabrication and characterization techniques. Topics include single crystal growth, thin film deposition, synthesis of quantum dots and nanotubes/nanowires, dielectric and electron emissive materials, nanocomposites, bioceramics and energy storage materials. Structure characterization techniques including diffraction, electron and scanning probe microscopy and optical spectroscopy are introduced. Spring. Physics staff.

MTSC 730 [103] STATISTICAL THERMODYNAMICS (3). Prerequisite, permission of the instructor. Theory of ensembles and interactions in statistical mechanics. Classical and quantum statistics. Applications to simple systems: ideal gas, heat capacity of solids, blackbody radiation, phase transitions. Fall. Chemistry staff.

MTSC 735 [104] TECHNIQUES IN MATERIALS SCIENCE (3). Prerequisite, permission of the curriculum. Lecture and laboratory in materials analysis techniques, including microscopy, x-ray diffraction and fluorescence, magnetic resonance, thermal analysis, XPS, channeling and RBS, mechanical properties, optical spectroscopy. Spring. Faculty.

MTSC 750 [105] KINETICS, DIFFUSION AND PHASE TRANSITIONS OF MATERIALS (3). Reaction kinetics in bulk materials. Mass transport, microstructural transformations, and phase transitions in condensed phases. Atom diffusion in solids. Spinodal decomposition. Spring. Faculty.

MTSC 810 [242] DEVICE PHYSICS AND ELECTRONIC PROPERTIES OF SOLIDS (3). Prerequisite, PHYS 573 or APPL 470, MTSC 615, MTSC 730, or permission of the instructor. Survey of crystal structure, bandstructure, transport. Overview of FETs, heterostructures, light emission, dissipation, noise, integrated circuits, solar cells and ceramics. Emphasis on physical sources of device behavior.

MTSC 820 [245] OPTICAL PROPERTIES OF SOLIDS (3). Prerequisites, APPL 470 or PHYS 573, PHYS 415, or permission of the instructor. Reflection, waveguides, nonlinear optics, optical switching, photorefraction, optical storage. Optical coupling to electronic states, device applications, optical computing.

MTSC 830 [249] ION-SOLID INTERACTIONS (3). Prerequisite, APPL 470 or PHYS 573 or permission of the instructor. Interatomic potentials, range distribution, radiation damage, annealing, secondary defects, analytical techniques, silicon-based devices, implantation in compound semiconductors and buried layer synthesis. Ion implantation in metals, ceramics, polymers and biomaterials.

MTSC 840 [250] NEW TECHNOLOGIES AND DEVICE ARCHITECTURE (3). Prerequisites, PHYS 573 or APPL 470, MTSC 615, MTSC 730 or permission of the instructor. Survey of novel and emerging device technologies. Resonant tunneling transistors, HEMT, opto-electronic devices and optical communication and computation, low-temperature electronic, hybrid superconductor devices.

MTSC 871 [270], 872 [271] SOLID STATE PHYSICS (PHYS 871, PHYS 872) (3 each). Prerequisite, PHYS 321 or equivalent. Topics considered include those of PHYS 573, but at a more advanced level, and in addition a detailed discussion of the interaction of waves (electromagnetic, elastic, and electron waves) with periodic structures; e.g., x-ray diffraction, phonons, band theory of metals and semiconductors. Fall and spring. Physics staff.

MTSC 891 [200] SPECIAL TOPICS IN MATERIALS SCIENCE (1–3). Prerequisite, permission of the curriculum. Current topics in materials science, including electronic and optical materials, polymers and biomaterials.

MTSC 992 [392] MASTER'S (NONTHESIS) (3–9).

MTSC 993 [393] MASTER'S THESIS (3–6). Prerequisite, permission of the curriculum.

MTSC 994 [394] DOCTORAL DISSERTATION (3–9). Prerequisite, permission of the curriculum.

Department of Art

www.unc.edu/art
MARY D. SHERIFF, *Chair*

Professors
Jaroslav T. Folda, S. Elizabeth Grabowski, Jim Hirschfield, Yun-Dong Nam, Mary D. Sheriff, elin o'Hara slavick, Mary C. Sturgeon, Dennis J. Zaborowski.

Associate Professors
Pika Ghosh, Juan Logan, Mary Pardo, Dorothy Verkerk.

Assistant Professors
Glaire Anderson, Cary Levine, Carol Magee, Mario Marzan, Kimowan McLain, Jeff Whetstone, Lyneise Williams.

Lecturers
Susan Harbage Page, Michael Sonnichsen, David Tinapple

Ackland Art Museum:

Adjunct Professors
Emily Kass, Timothy Riggs.

Adjunct Associate Professors
Barbara Matilsky, Carolyn Wood.

Adjunct Assistant Professor
Carolyn Allmendinger.

Adjunct Instructor
Lyn Koehnline.
North Carolina Museum of Art:

Adjunct Associate Professors
John Coffey, Kinsey Katchka, Mary Ellen Soles, David H. Steel, Dennis P. Weller.

Professors Emeriti
Robert Barnard, James Gadson, Frances Huemer, Sara Immerwahr, Richard W. Kinnaird, Arthur Marks, Jerry Noe, Marvin Saltzman.

For those considering professional careers as art historians (teaching and research), critics or museum or gallery professionals, the Department of Art offers graduate work leading to the degrees of master of arts and doctor of philosophy. Those who aim to become professional artists should take the degree of master of fine arts. The Hanes Art Center provides exhibition galleries, a departmental library, a visual resources library, offices, study areas, classrooms and studios. Additional studios and shops are located in the Art Laboratory building on Airport Drive, one mile from campus. The Joseph C. Sloane Art Library has a collection of nearly 100,000 volumes and is supplemented by the University's Academic Affairs libraries, with holdings of more than 5,000,000 volumes. The Sloane Art Library collection provides computer terminals for catalogs and houses the reserve holdings for Art Department courses. Graduate students have access to the departmental visual resources library, which has current holdings of 225,000 slides, 15,750 digital images and 40,000 photographs.

Admission

Deadline for applications is January 1. The Graduate School application is submitted via the online application for admission (https://admissionsapp.unc.edu/grad/default.asp). This user-friendly, online application is faster and easier than completing a paper application and provides for the prompt receipt and distribution of application information. Individuals who are unable to utilize the online application may request a paper application from gradinfo@unc.edu or by phoning (919) 966-2612.

Master of Fine Arts (M.F.A.)

Applications are welcome from students holding a bachelor's degree in art or from students with an undergraduate degree in another field who present a strong portfolio in art. A background of at least one basic-level course and one intermediate-level course is necessary to prepare the applicant adequately for the required graduate-level courses in art history and a cognate field. In addition to the UNC-Chapel Hill application, applicants to the M.F.A. program must submit directly to the Department of Art a portfolio of representative examples of creative work. Ten slides, identified and labeled as described at www.unc.edu/art/studio_art/graduate/how_to_label_your_slide.pdf, are required and should be enclosed in plastic slide sheets. Applicants should not send original works. A slide description sheet noting dimensions, media and date of each piece should be included. A statement of purpose (i.e., reasons for pursuing graduate study in studio art), along with an artist statement, should also be submitted. Portfolios of those admitted become property of the department and are retained in the student's file. The portfolios of applicants who are not offered admission will be returned if accompanied by a self-addressed envelope with sufficient return postage. The Graduate Record Exam (GRE) is not required for application to the M.F.A. program.

Master of Arts (M.A.) and the Doctorate (Ph.D.)

In addition to completing an application to The Graduate School (which must include up-to-date GRE scores), the candidate for admission to the programs in art history must submit directly to the Department of Art an example of his/her written work. The writing sample should be no more than 15 pages. All applicants for graduate study in art history are admitted to the program as candidates for the master of arts degree unless they have already received or expect to receive the M.A. degree in art history from another institution. An undergraduate major in art history is not required for M.A. candidacy; however, entering candidates must have taken a minimum of 24 semester hours in art history, archaeology, cultural anthropology or aesthetics.

There are no spring semester admissions in either studio art or art history.

Degree Requirements for Studio Art

The master of fine arts degree at UNC-Chapel Hill is a two-year, 60-hour program. The majority of credits are earned as independent study and critiqued under the direction of a resident professor advisor. Further interaction with the studio faculty is encouraged through a series of critiques/reviews. In the first year, students interact one-on-one with the whole studio faculty through appointments and in a series of scheduled individual meetings. In the second year, students select a thesis committee composed of at least three members, two of whom must come from the studio faculty. Students may have representation of faculty on the thesis committee from outside the Department of Art. Through interaction with faculty both within the art department and in the University at large, students are guided technically and intellectually toward producing work that reflects the unique and personal conviction of the artist/student.

Believing that technique must serve the visual ideas, the Studio

Art faculty stresses the image-making/conceiving process as integral to the execution of the work. As each student understands his or her own point of view with regard to issues being addressed in the work, faculty serve as guides and instructors in technique when necessary and appropriate. Given this approach, students do not necessarily choose a particular medium for specialized concentration. Determinations of media focus are arrived at through an examination of aesthetic and conceptual goals. This does not preclude a media focus, but suggests that any choices made must be considered as part of the students' intellectual and aesthetic explorations.

The academic component of the M.F.A. program is designed to complement the main purpose of making art. The program operates under the philosophy that the decision to pursue the making of fine art in an academic context carries an attendant responsibility to develop the verbal and written articulation of the visual. To accomplish this goal, students participate each semester in a graduate seminar (three credit hours per semester), conducted by the faculty and/or the artist-in-residence. Contemporary critical issues including social, cultural, political and aesthetic ideas surrounding the making of art are explored and debated in this group forum. This also provides an opportunity for young professionals to interact with accomplished, successful artists, working in a variety of contexts.

A continuation of this more traditional academic endeavor is accomplished by a requisite nine hours of additional course work in art history and/or related fields. Course selections are made depending on the focus of the individual student's research; selected courses will supplement and stretch the potential of the creative work from an academic perspective. Usually students are urged to take one of these courses in the area of 20th-century art history. The remaining hours are Master's Thesis, taken in the final semester. The thesis hours basically constitute the preparation of the thesis exhibition and the writing of the thesis document.

The conclusion of the M.F.A. program is the group exhibition of the thesis work produced under the direction of the thesis committee. Students write a thesis document/statement to accompany the thesis work. A final oral defense takes place during the time of the exhibition. Once the oral defense has been passed, students submit a copy of the thesis statement (along with slide and photo documentation of the thesis work) for permanent retention in the Sloane Art Library.

An additional feature of the UNC-Chapel Hill Master of Fine Arts program is the Hanes Visiting Artist Lecture Series. This program has proved to be a vital conduit for graduate students to see the work of and interact with a large and diverse number of professional artists. The artists are typically invited to campus for a two-day visit, in which they give a public lecture and then give private critiques for the department's graduate students.

Financial Aid for Studio Art Students

All applicants for admission to the M.F.A. program are automatically considered by the department for nomination in the University Fellowship Competition. Applicants and students in residence are eligible for teaching assistantships and graduate assistantships that are awarded on a semester basis. Students desiring financial aid should consult as early as possible the Office of Scholarships and Student Aid, CB# 2300, 300 Pettigrew Hall, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-2300 (www.unc.edu/studentaid) for information about work-study jobs and loans.

Degree Requirements for Art History

Master of Arts Degree

The master of arts degree generally follows the requirements of The Graduate School as described in the section on graduate degree requirements in *The Graduate School Handbook*.

Purpose of the M.A. degree: both a broad knowledge of world art and a basic sampling of the diverse theory and methods employed by our faculty in the discipline of art history.

The master's program in art history is designed to be completed in four semesters.

Diagnostic Slide Examination

During the first week of their first semester, entering M.A. students take a diagnostic slide examination (DSE). The purpose of the DSE is to identify one or more areas where the graduate students need to develop visual knowledge beyond their undergraduate background. It is in no way punitive, nor is it graded. Since the field of art history is increasingly global, and our program encourages a more global approach, the diagnostic exam serves to assist the new graduate student in identifying an area in which he or she would like to increase his or her visual repertoire by auditing a survey class offered by one or more of the faculty.

Course Work

Total of 12 courses, 36 credits.

Three required courses: Methods (ART 750) in the first semester; Thesis Writing (ART 992) and Thesis Registration (ART 993) in the fourth semester.

Nine courses, of which five should be graduate seminars (900 level).

At least two courses must be before 1700 C.E.; two after 1700 C.E.

Student must take courses with five different members of the graduate faculty.

Students are advised to audit two survey courses over the course of their first two semesters in order to develop some breadth of knowledge.

Graduate Courses: www.unc.edu/gradrecord/programs/art.html

Language Requirement

M.A. Degree: By the end of the third semester, all M.A. students are required to have met the language requirement in German or a Romance language, either by obtaining a passing grade on the UNC-Chapel Hill reading competency exam or by passing German 602x or French 602x (graduate-level reading courses offered by UNC-Chapel Hill).
Note: No credit toward the M.A. course work requirement is given for language courses.

Master's Exam

M.A. students take this exam at the beginning of their third semester. Students who do not pass the exam at that time may re-take the exam at the end of the third semester. Only students who have successfully passed the exam may register for ART 992 (M.A. Thesis-Writing Seminar) or ART 993 (M.A. Thesis Registration). The exam is offered only during the fall semester.

Master's Thesis

The M.A. thesis is completed by the end of the fourth semester of enrollment. The completed thesis must be signed by the members of the Thesis Committee and submitted to The Graduate School in time for May graduation.

Doctor of Philosophy Degree

The degree of doctor of philosophy generally follows the requirements

of The Graduate School as described in the section on graduate degree requirements in *The Graduate School Handbook*.

Course Work

Ph.D. students take a total of nine courses, at least four of which are research seminars (900-level), plus a final course, ART 994 (Dissertation Registration). Two of the nine courses may be taken in other departments as electives for supplementary and complimentary studies.

Electing to pursue an External Minor: Ph.D. students may choose to complete a formal external minor, which consists of at least three additional courses in a field related to his or her area of specialized study (such as communication studies, women's studies, history or medieval studies). The student must secure prior approval of the minor department, and a copy of the proposed courses to be taken must be signed by both departments and entered in the student's permanent record in the Department of Art and the UNC-Chapel Hill Graduate School.

Language Requirement

Ph.D. students are required to demonstrate proficiency in two languages (other than English) appropriate to the area of study, to be determined in consultation with advisor, director of graduate studies and graduate committee. Some fields require additional languages and students should study these languages as necessary.

Preliminary Doctoral Exams

Ph.D. students take both the written and the oral preliminary exams during the semester after the Ph.D. course work is completed. Most Ph.D. students will take the preliminary exams during the spring semester of their second year in the Ph.D. program. Those students pursuing an external minor will take the preliminary exams during the fall semester of their third year.

- *Written Exams.* Students take the written preliminary exams over the course of a one-week period. Students who fail the written exams may repeat them only once. These exams are taken in three parts: major field of study (eight hours), minor area of study related to the major field (four hours), minor area of study not related to the major field (four hours).
- *Oral Exam, or "Prospectus Meeting."* Approximately three weeks after passing the written exams, Ph.D. students defend their dissertation prospectus orally. At least two weeks before the oral examination, the student submits a dissertation prospectus to his or her dissertation committee, which should consist of five faculty members, three of whom must be permanent members of the UNC-Chapel Hill art history faculty.

Dissertation and Final Oral Exam

After passing the preliminary doctoral exams, the student begins work on the dissertation. Once the dissertation is completed and approved by the advisor and dissertation committee, the student defends the finished dissertation. Doctoral students have eight calendar years from the date of first registration in the Ph.D. Graduate School to complete the Ph.D. For doctoral students, there is a minimum residence credit requirement of four semesters, and at least two semesters must be earned through continuous full-time registration on the UNC-Chapel Hill campus. For further information the applicant should write to the director of graduate studies for art history.

Financial Aid for Art History Students

All applicants for admission who have completed their applications by January 1 are automatically considered by the department for nomination for Graduate School awards. Applicants and students in residence are also eligible for teaching and research assistantships, which are awarded by the department. There are also annual service and nonservice awards. Students desiring financial aid should consult as early as possible the Office of Scholarships and Student Aid, CB# 2300, 300 Pettigrew Hall, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-2300 (studentaid.unc.edu) for information about work-study jobs and loans.

Art History

Courses for Graduates and Advanced Undergraduates

451 [151] WOMEN IN THE VISUAL ARTS II (WMST 451) (3). Prerequisite, ART 151, ART/WMST 254 or permission of the instructor. Discussion of topics related to the representation of women in Western art and/or women as producers of art. Sheriff.

453 AFRICA IN THE AMERICAN IMAGINATION (AFRI 453) (3). Prerequisite, art history or permission of the instructor. Examines the ways African art appears in United States popular culture (advertisements, magazines, toys, films, art) to generate meanings about Africa. Addresses intersecting issues of nationalism, multiculturalism, imperialism, nostalgia, race.

456 [128] ART AND RITUAL IN SOUTH ASIA (ASIA 456) (3). This thematic course explores how objects and monuments are viewed, experienced and used in a ritual context in South Asia. Ghosh.

457 [187] STUDIES IN THE HISTORY OF GRAPHIC ART (3). Prerequisite, any intermediate art history course or permission of the instructor. Study of prints and printmaking in Western art from ca. 1400 to the present focusing on selected topics. Riggs.

458 ISLAMIC PALACES, GARDENS AND COURT CULTURE (EIGHTH-16TH CENTURIES CE) (3). Prerequisite, ART 154 or permission of the instructor. This course focuses on palaces, gardens and court cultures beginning with the eighth-century Umayyad period and ending with the 16th-century reigns of the Mughal, Safavid and Ottoman dynasties.

460 [193] GREEK PAINTING (CLAR 460) (3). Prerequisite, any intermediate art history course or permission of the instructor. A survey of the development of Greek art from geometric to Hellenistic painting through a study of Greek vases, mosaics and mural paintings. Sturgeon.

461 [194] ARCHAIC GREEK SCULPTURE (CLAR 461) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of sculpture during the archaic period in Greece. Sturgeon.

462 [195] CLASSICAL GREEK SCULPTURE (CLAR 462) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of Greek sculpture during the classical period. Sturgeon.

463 [196] HELLENISTIC GREEK SCULPTURE (CLAR 463) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of Greek sculpture in the Hellenistic period. Sturgeon.

464 [190] GREEK ARCHITECTURE (CLAR 464) (3). Prerequisite, CLAR 244 or permission of the instructor. The course is a survey of Greek architectural development from the Dark Age through the fourth century BCE, with particular emphasis given to the archaic and classical periods. Among the special topics to be considered are the beginnings of monumental architecture in Greece, the evolution and development of the orders, the merging of the orders, and the varying interpretations of individual architects in terms of style, the definition of space and proportions. Sams.

465 [191] ARCHITECTURE OF ETRURIA AND ROME (CLAR 465) (3). Prerequisite, CLAR 245 or permission of the instructor. The development of architecture in Italy and in the Roman world from the ninth century BCE through the fourth century CE. The course will focus upon the development of

Roman urbanism and on the function, significance and evolution of the main building types, as well as their geographic distribution. In addition, particular attention will be paid to the political, social, economic and cultural implications of public monumental as well as private residential architecture.

466 [153] HISTORY OF THE ILLUMINATED BOOK (3). Prerequisite, any intermediate art history course or permission of the instructor. Chronological survey of major developments in book painting during the European Middle Ages from 300 to 1450 CE. Folda, Verkerk.

467 [155] CELTIC ART AND CULTURES (3). This course explores the art and culture from the Hallstat and La Tène periods (seventh century BCE) to the Celtic "renaissance" (ca. 400-1200 CE). Verkerk.

471 [154] NORTHERN EUROPEAN ART OF THE 14TH AND 15TH CENTURIES (3). Prerequisite, any intermediate art history course or permission of the instructor. Advanced study of painting and sculpture in France, England and the Netherlands, 1300 to 1400. Folda.

472 EARLY MODERN WESTERN ART, 1400–1750 (3). Prerequisite, intermediate art history course or permission of the instructor. This course explores specialized themes and/or broad topics in Western European art of the early modern period.

473 EARLY MODERN AND MODERN DECORATIVE ARTS (3). This course traces major historical developments in the decorative and applied arts, landscape design and material culture of Western society from the Renaissance to the present.

480 [062] BRITISH ART (3). Prerequisite, any introductory art history course or permission of the instructor. Survey of British painting from the time of Hogarth (ca. 1750) through the 19th century. Emphasis will be given to significant artists (Hogarth, Reynolds, Turner, Gainsborough, Constable); movements (neoclassicism, romanticism, pre-Raphaelitism); and ideas (impact of science, industrialization).

487 [086] AFRICAN IMPULSE IN AFRICAN AMERICAN ART (AFAM 487) (3). This class will examine the presence and influences of African culture in the art and material culture of Africans in the Americas from the colonial period to the present.

488 CONTEMPORARY AFRICAN ART (AFRI 488) (3). Prerequisite, ART 152 or ART 155 or permission of the instructor. Examines modern and contemporary African art (1940s to the present) for Africans on the continent and abroad. Examines tradition, cultural heritage, colonialism, postcolonialism, local versus global, nationalism, gender, identity, diaspora.

490 SPECIAL TOPICS IN VISUAL ARTS (3). Prerequisite, intermediate level art history or permission of the instructor. This entails an intensive look at issues in the visual arts, and may cover specialized topics or broad themes from any part of the world or any historic period.

514 [132] MONUMENTS AND MEMORY (HIST 514, INTS 514) (3). Since the emergence of the idea of "public," museums and monuments have played a key role in the formation of cultural memory and identity, both nationally and globally. This course explores the relation between museums and monuments historically and theoretically, and relates them to national and international developments in the 19th and 20th centuries.

550 [183] TOPICS IN CONNOISSEURSHIP (3). Permission of the instructor. Works in the Ackland Museum's collection will be studied directly, as a means of training the eye and exploring the technical and aesthetic issues raised by art objects. Bolas, Riggs, Koehnline, Wood.

551 INTRODUCTION TO MUSEUM STUDIES (3). Introduces careers in museums and other cultural institutions. Readings and interactions with museum professionals expose participants to curation, collection management, conservation, exhibition design, administration, publication, educational programming and fundraising. Bolas, Riggs, Koehnline, Wood.

552 [185] THE LITERATURE OF ART (3). Prerequisite, any intermediate art history course or permission of the instructor. A study of the principal critics and historians who have contributed to the development of modern art history. Also application of the principles to specific works of art. Staff.

553 [080D] THE BODY IN SOCIAL THEORY AND VISUAL REPRESENTATION (3). A study of how the human body has been represented in contemporary art and the relation of those representations to theories of the individual and society.

554 IMAGINING OTHERNESS IN VISUAL CULTURE IN THE AMERICAS (AFAM 554) (3). Prerequisite, intermediate level art history or permission of the instructor. This course examines representational othering of black, Asian, Latino/a and Native American people in images in the Americas through postcolonial topics like racial stereotyping, Orientalism, primitivism, essentialism and universalism.

561 ART AND SOCIETY IN MEDIEVAL ISLAMIC SPAIN AND NORTH AFRICA (ASIA 561) (3). Prerequisite, ART 154 or permission of the instructor. This course introduces the art and architecture of medieval Islamic Spain and North Africa between the eighth and 16th centuries.

581 [181] MODERN ART AND CRITICISM (3). Prerequisite, any intermediate art history course or permission of the instructor. A study of modern art (ca. 1850–1945) with special emphasis on the reception and evaluation of works by writers and art critics. Mavor.

583 [180] THEORIES OF MODERN ART (3). Prerequisite, any intermediate art history course or permission of the instructor. A study of theoretical issues central to the understanding of trends in modern art (e.g., modernism, the avant-garde, formalism originality). Mavor.

597 STUDIOLO TO WUNDERKAMMER (3). Prerequisite, intermediate level art history or permission of the instructor. This course explores the history of early modern collecting, encompassing scholars' and merchants' "study rooms," aristocrats' menageries, humanists' "sculpture gardens" and princely cabinets of wonders.

The content of these courses varies slightly from year to year in accordance with the needs of the students and the special competence of the instructor.

Courses for Graduates

In the seminars listed, the topics for study change from year to year depending upon the professor conducting the course. Architecture, sculpture, painting or a combination of these may be the subject. Consult the department schedule for details on specific courses in any given semester.

680 [296] ROMAN SCULPTURE (CLAR 680) (3). This course surveys Roman sculpture from about 500 BCE to 400 CE, including different media such as portraiture, state reliefs, mythological and other reliefs, idealizing sculpture (divinities, mythological figures, heroes) sarcophagi and other funerary monuments, and decorative sculpture. Emphasis will be placed on style, iconography and the historical development of Roman sculpture in its social, cultural, political and religious contexts.

683 [299] ETRUSCAN ART (CLAR 683) (3).

750 [276] ADVANCED READINGS TOPICS IN THE HISTORY OF ART (3).

751 [251] GENDER AND VISUAL CULTURE (WMST 751) (3). Sheriff, Mavor.

763 [201] MEDIEVAL STUDIES (3). Folda, Verkerk.

794 [294] GREEK TOPOGRAPHY (CLAR 794) (3).

797 [297] ROMAN PAINTING (CLAR 797) (3).

798 [298] ROMAN TOPOGRAPHY (CLAR 798) (3).

910 [310] SEMINAR IN ARCHITECTURE (3).

950 [301] PROBLEMS IN THE HISTORY OF ART (3). Staff.

952 [378] SEMINAR IN MUSEUM STUDIES (3).

955 [360] SOUTH ASIAN ART (3). Ghosh.

957 [359] SEMINAR IN AFRICAN ART (3). Harris.

960 [358] SEMINAR IN ANCIENT ART (CLAR 960) (3). Sturgeon.

961 [350] SEMINAR IN MEDIEVAL ART (3). Folda.

962 [351] SEMINAR IN MEDIEVAL ART (3). Verkerk.

970 [352] SEMINAR IN RENAISSANCE ART (3). Pardo.

971 [353] SEMINAR IN RENAISSANCE (3). Pardo.

972 [354] SEMINAR IN BAROQUE ART (3).

980 [357] SEMINAR IN MODERN ART (3). Mavor, Sheriff, Harris.

981 [355] SEMINAR IN 19TH-CENTURY ART (3). Sheriff.

982 [356] SEMINAR IN AMERICAN ART (3). Marks, Harris.

992 [280] MASTER'S THESIS WRITING SEMINAR (3).

993 [393] MASTER'S THESIS (3 or more).

994 [394] DOCTORAL DISSERTATION (3 or more).

Studio Art

Courses for Graduates

700 [230] GRADUATE STUDIO ART SEMINAR (3).

701 [231]/702 [232] TA PRACTICUM (3).

710 [240] GRADUATE STUDIO (Var.).

713 [241] GRADUATE SCULPTURE (Var).

718 [242] GRADUATE PRINTMAKING (Var).

720 [250] QUALIFYING REVIEW (2).

993 [393] MASTER'S THESIS (3 or more).

Department of Biochemistry and Biophysics

www.med.unc.edu/wrkunits/2depts/biochem
LESLIE V. PARISE, *Chair*

Professors

Sharon Campbell (18) NMR Spectroscopy, Structure and Regulation of Proteins Involved in Ras-Mediated Cell Signaling
Michael Caplow (16) Chemistry of the Microtubule Cytoskeleton
Charles W. Carter Jr. (19) Structural Molecular Biology, Protein Structure-Function, X-ray Crystallography of Proteins Including Aminoacyl tRNA Synthetases, Deaminases, Phasing Methods and Crystal Growth
Stephen G. Chaney (25) Chemistry and Action Mechanism of Platinum Anticancer Agents, DNA Repair, Effects of DNA-Damaging Agents on DNA Replication
David Clemmons (15) Receptor Signaling
Stephen Crews (24) Molecular Genetics of Nervous System Development, Transcriptional Control, Evolution of Regulatory Mechanisms
Marshall Edgell (143) Use of Biophysical and Genetic Techniques Using Combinatorial Libraries and High Throughput Robotics to Assess Determinants of Protein Structure
Beverly Errede (144) Function and Regulation of MAP-Kinase Activation Pathways in Saccharomyces cerevisiae
Jack Griffith (41) Architecture of DNA-Protein Complexes Involved in Replication, Repair, and Telomere Maintenance, Electron Microscopy
Hengming Ke (50) X-ray Crystallography, Structure and Function of Biologically Important Proteins such as Phosphodiesterase and Molecular Chaperone System
Barry R. Lentz (62) Biomembrane Structure and its Relationship to Function, Platelet Membranes in Blood Coagulation, Membrane Fusion, Liposomes
Patricia F. Maness (68) Mechanisms of Cell Signaling and Adhesion, Axon Guidance and Synaptic Plasticity
William F. Marzluff (69) Control of Gene Activity, Cell-Cycle Regulation in Early Embryos, Control of Expression of Histone mRNA
Gerhard W. Meissner (79) Intracellular Ca2+ Signaling and Regulation of Ion Channels in Striated Muscle
Gary Pielak (99) Protein Structure/Function Using 2-D NMR
Aziz Sancar (105) DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes, Molecular Neurobiology, Reaction Mechanism of Human Blue-Light Photoreceptor
Gwendolyn B. Sancar (104) Cellular Responses to Genotoxic Stress, DNA Repair, Transcriptional Regulation of Stress Response Genes
John Sheehan (111) Understanding the Role of Glycoconjugates in Biology
Ronald I. Swanstrom (123) Molecular Biology of HIV, Resistance to HIV Protease Inhibitors
Michael D. Topal (126) Protein-DNA Recognition, Genomic Instability
Thomas W. Traut (128) Enzyme Structure and Regulation, Allosteric Dissociating Enzymes
Terry Van Dyke (132) Molecular Regulation of Cell Growth Control, Cell Specificity of Tumor Suppression Function, Gene Regulation
Elizabeth M. Wilson (134) Mechanisms of Steroid Hormone Action, Androgen Regulation of Gene Transcription
Richard V. Wolfenden (139) Enzyme Mechanisms, Water Affinities of Biological Compounds
Yue Xiong (140) Molecular Mechanisms of Cell Cycle Control, Tumor Suppression and Development

Associate Professors

Ed Collins (23) Use of Biophysical Tools to Study Immunological Problems Focusing on Immune Recognition of Cancer
Henrik Dohlman (17) Regulators of G Protein Signaling, Mechanisms of Drug Desensitization
Ann Erickson (33) Cellular Protein Targeting, Lysosomal Enzyme Biosynthesis, Secretion of Lysosomal Proteases by Transformed Cells
Howard M. Fried (39) Cell and Molecular Biology, Mechanisms of Nuclear-Cytoplasmic Transport, Mechanisms of RNA-Protein Recognition
Dale Ramsden (108) Mechanism of V(D)J Recombination, End-Joining Pathway for Repair of DNA Double Strand Breaks
John Sondek (117) Protein Crystallography and Signal Transduction
Yi Zhang (138) Chromatin Dynamics, Gene Expression, Cellular Proliferation

Assistant Professors

Xian Chen (12) Protein-Protein and Protein-Ligand Interaction, Protein Tertiary Structure, Quaternary Structure of Multi-Protein Complexes, Structure-Function Relationship of Proteins, Functional Proteomics
Jean Cook (150) Regulation of DNA Replication in Mammalian Cells
Lyndon Cooper (21) Osteoblast Responses to Physiological Stress: Characterization of the Heat Shock Response and Mechanochemical Deformation and Stimulation
Nikolay Dokholyan (47) Computational Structural Biology
Brian Kuhlman (72) Computational Protein Design, Protein-Protein Interactions, Structural Biology
Andrew Lee (71) Protein, Structure and Dynamics, NMR Spectroscopy
Matthew Redinbo (110) Structural Biology of Proteins and Protein-Nucleic Acid Complexes
Brian Strahl (120) Mechanisms of Chromatin-Mediated Gene Transcription

Research Professors

David G. Kaufman (53) Cellular and Molecular Mechanisms of Cancer Development, Epithelial Cell-Stromal Cell Interactions, Cell-Cycle Influences on Carcinogenesis

Arrel D. Toews (125) Neurochemistry, Neurotoxicology: Metabolism and Gene Expression during Demyelination and Remyelination, Molecular Biology of Cholesterol Metabolism and Trafficking

Professors Emeriti

Michael K. Berkut
Edward B. Glassman
Dr. Jan Hermans
David J. Holbrook Jr.
William Henry Pearlman
Ralph Penniall
Howard A. Schneider
George K. Summer
Robert H. Wagner
James R. White
John E. Wilson

The Department of Biochemistry and Biophysics is an administrative division of the School of Medicine and a member of The Graduate School. The graduate program offers instruction and research opportunities leading to the Ph.D. degree. Although the department offers the M.S. degree, the graduate program is not designed as a terminal master's curriculum. Applicants are offered admission with the expectation that they will complete their doctorate.

Modern research in biochemistry and biophysics is designed to address mechanism and function; it utilizes the paradigms of molecular biology, but is influenced by chemistry, physics and genetics. The philosophy of the department and its graduate program is to provide students with broad training in modern approaches to the field and unique opportunities for multidisciplinary training.

Curriculum

Students admitted to the graduate program take any two of the following six courses: BIOC 601, 631, 632, 643, 644, 655 or any three of the physical biochemistry modules (BIOC 650–653, 660–678). In addition, all students take a special seminar course (BIOC 701) and select a minimum of three laboratory rotations (BIOC 702). These four core courses can be completed during the first year when a student has all prerequisites. A scientific writing course, BIOC 712, is required during the second year. This course is designed to prepare students for the Comprehensive Examination, which is in the format of an NIH grant proposal. Students are also required to take a minimum of 12 semester hours of electives, including at least three three-hour lecture courses. The remainder of the electives can be either seminar or lecture courses. The electives may be courses offered either by the Department of Biochemistry and Biophysics or by other departments. Further information on course requirements may be found in the Guidelines for Students in the Graduate Program in Biochemistry and Biophysics at The University of North Carolina at Chapel Hill.

Students in the combined M.D./Ph.D. program are required to complete two of the following courses (six credit hours): BIOC 601, 631, 632, 643, 644, 655 or any three of the physical biochemistry modules (BIOC 650–653, 660–678), as well as BIOC 701 (three credit hours), two rotations in BIOC 702 (four credit hours) and BIOC 712 (two credit hours). School of Medicine courses can serve in lieu of electives.

A faculty committee advises entering students about course selection until the student chooses a research sponsor. Students select research sponsors from the department's primary and joint faculty members following the three laboratory rotations. After a research sponsor has been selected, a dissertation committee is formed to review the student's yearly progress. The examinations required for admission to candidacy for the Ph.D. are administered as a comprehensive exam and a written research proposal. The comprehensive exam will cover major topics in the areas of biochemistry/biophysics and cell/molecular biology. The written research proposal will be on the student's chosen research project and will be defended in an oral examination. The most important requirement for the Ph.D. degree is a dissertation of original research carried out independently by the candidate. The Ph.D. candidate is required to conduct a final oral defense of a dissertation.

Financial Aid and Admissions

Funds available from the University, the department and individual research grants provide stipends for students. All applicants are considered for special fellowships and teaching or research assistantships. In 2007 students received a stipend of $24,000 plus in-state tuition and fees. Major medical insurance was also provided. Nonresidents with predoctoral fellowships or assistantships are recommended for special tuition rates. Applications are considered from prospective graduate students who present evidence of superior scholarship in biology, chemistry or biochemistry. The department recommends that students prepare themselves by taking general and organic chemistry, biochemistry, biology, physics and calculus. It is anticipated that students who have not had these courses will take them, as appropriate, after their arrival. Departmental information may be obtained through the department's Web site: www.med.unc.edu/wrkunits/2depts/biochem. Applicants should apply online at gradschool.unc.edu.

Research Interests

The faculty research interests are diverse and include research in the following areas: cell signaling and growth control, DNA repair and replication, membrane biophysics and function, molecular regulation including transcriptional control, nervous system development and function, and protein structure/function, including enzymology. Model systems used by the faculty range from bacteria to mammals; techniques span molecular biology to physical biochemistry. A brochure describing the department and more detailed faculty research interests can be obtained by writing to the director of graduate studies of the Department of Biochemistry and Biophysics, or by visiting the department's Web site: www.med.unc.edu/wrkunits/2depts/biochem.

Facilities

The departmental research facilities are centered in the Mary Ellen Jones Building, which is within walking distance of the Cancer Research Center and the departments of Biology, Chemistry and Physics. The building is equipped with instruments for molecular biological, biochemical, structural and biophysical research. Animal-care facilities are available to support the department's research endeavors. The computer facilities are networked within the department, to the Research Triangle area, and to national and international databases. Color graphics workstations (including an Evans & Sutherland PS350) and high-speed minisupercomputers are available within the department.

Courses for Graduates and Advanced Undergraduates

402 [102] UNDERGRADUATE RESEARCH IN BIOCHEMISTRY (1–21).

Prerequisites, an overall 3.0 GPA and permission of the course director. For juniors and seniors who wish to carry out an independent, mutually arranged research project in the laboratory of a biochemistry faculty sponsor. Restricted to on-campus work. Minimum three hours per week for each unit of credit per semester. May be repeated. May not substitute for honors, advanced elective or other course requirements of another department. A written report is required in each term. Fall and spring. Fried, staff.

442 [142] BIOCHEMICAL TOXICOLOGY (ENVR 442, TOXC 442) (3). Prerequisites, CHEM 430 and one course in biochemistry; permission of the instructor if prerequisites not met. Biochemical actions of toxicants and assessment of cellular damage by biochemical measurements. Three lecture hours per week. Spring. Harper (course director).

505 [105] MOLECULAR BIOLOGY (GNET 505) (3). Prerequisites, undergraduate biochemistry or genetics, and organic chemistry. Techniques in molecular biology; mechanisms of DNA replication, transcription and translation of genetic material in prokaryotic and eukaryotic systems; genomics, gene organization; regulatory and signaling mechanisms; and molecular biology of cancer. Fall. Crews, Fried, Van Dyke, Xiong.

601 [104] ENZYME PROPERTIES, MECHANISMS AND REGULATION (3). Prerequisite, CHEM 430 or equivalent. Focuses on enzyme architecture to illustrate how the shapes of enzymes are designed to optimize the catalytic step and become allosterically modified to regulate the rate of catalysis. Fall. Traut, Wolfenden.

631 [110] ADVANCED MOLECULAR BIOLOGY I (BIOL 631, GNET 631, MCRO 631, PHCO 631) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. DNA structure, function and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours a week. Fall. Griffith, Matson, A. Sancar.

632 [111] ADVANCED MOLECULAR BIOLOGY II (BIOL 632, GNET 632, MCRO 632, PHCO 632) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. The purpose of this course is to provide historical, basic and current information about the flow and regulation of genetic information from DNA to RNA in a variety of biological systems. Three lecture hours a week. Spring. Baldwin, Marzluff, Strahl.

643 [117] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (CBIO 643, MCRO 643, PHCO 643) (1–21). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Fall. Meissner, staff.

644 [118] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (CBIO 644, MCRO 644, PHCO 644) (1–21). Prerequisite, undergraduate cell biology or biochemistry or permission of instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Cox, staff.

650 BASIC PRINCIPLES: FROM BASIC MODELS TO COLLECTIONS OF MACROMOLECULES (1). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Basic molecular models and their use in developing statistical descriptions of macromolecular function. Course intended primarily for graduate students. Fall. Lentz.

650R MACROMOLECULES PRINCIPLES RECITATION (1). Corequisite, BIOC 650. Recitation and discussion session for participants of BIOC 650.

651 MACROMOLECULAR EQUILIBRIA: CONFORMATION CHANGE AND BINDING (1). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Macromolecules as viewed with modern computational methods. Course intended primarily for graduate students. Fall. Sondek (course director), Temple, Lentz.

652 [146] MACROMOLECULAR EQUILIBRIA (1). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Stability of macromolecules and their complexes with other molecules. Course intended primarily for graduate students. Fall. Hermans.

653 [147] MACROMOLECULAR SPECTROSCOPY (1). Prerequisites, CHEM 430 and two semesters of physical chemistry or permission of the instructor. Principles of UV, IR, Raman, fluorescence and spin resonance spectroscopies; applications to the study of macromolecules and membranes. Course intended primarily for graduate students. Spring. Lentz.

655 [134] CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3). Prerequisite, CHEM 430 or equivalent. Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, enzyme mechanisms and ATP enzymology. Spring. Carter.

660 [150A] INTRODUCTION TO LIGHT MICROSCOPY (1). Prerequisites, BIOC 650–653 or permission of the course director. Fundamentals of optics and light microscope design for the novice student. Spring (even-numbered years). Salmon (course director).

661 [150B] ADVANCED TOPICS IN IMAGING (2). Prerequisites, BIOC 650–653 or permission of the course director. Optical imaging including fluorescence and confocal techniques. Scanning and transmission electron microscopy and image interpretation. Mechanical imaging and scanning probe microscopy. Spring (even-numbered years). Costello (course director), Erie, Jacobson, Salmon, Superfine.

662 [151] MACROMOLECULAR INTERACTIONS (1). Prerequisites, BIOC 650–653 or permission of the instructor. Theory and practice of biophysical methods used in the study of interactions between macromolecules and their ligands, including surface plasmon resonance, analytical ultracentrifugation and calorimetry. Spring. Pielak (course director), Tripathy.

663A [152] MACROMOLECULAR NMR (1). Prerequisites, BIOC 650–653 or permission of the instructor. Principles and practice of nuclear magnetic resonance spectroscopy: applications to biological macromolecule structure and dynamics in solution. Course intended primarily for graduate students. Spring. Campbell (course director), Pielak, Young.

663B [152L] MACROMOLECULAR NMR PRACTICE (1). Prerequisite, BIOC 653 or permission of the course director. Lab section for BIOC 663A. Course intended primarily for graduate students. Spring. Campbell (course director), Pielak, Young.

666 [153] X RAY CRYSTALLOGRAPHY OF MACROMOLECULES (1). Prerequisites, BIOC 650–653 or permission of the instructor. Principles of protein crystallography, characterization of crystals, theory of diffraction, phasing of macromolecular crystals and structure refinement. Course intended primarily for graduate students. Spring. Ke.

667 [157] MACROMOLECULAR CRYSTALLOGRAPHIC METHODS (2). Prerequisite, BIOC 666 or permission of the course director. A combined lecture/laboratory workshop for serious students of protein crystallography. Course intended primarily for graduate students. Spring (odd-numbered years). Collins (course director), Redinbo, Carter, Sondek.

668 [154] PRINCIPLES OF AND SIMULATION OF MACROMOLECULAR DYNAMICS (1). Prerequisites, BIOC 650-653 or permission of the instructor. A combined lecture/computer lab treatment of the principles of macromolecular dynamics and structure as approached using the tools of molecular dynamics simulations. Course intended primarily for graduate students. Spring (odd-numbered years). Hermans (course director), Tropsha.

670 [156] BIOMOLECULAR INFORMATICS (1). Prerequisites, BIOC 650–653 or permission of the instructor. A combined lecture/computer lab course introducing the methods and principles of biological data management as this relates to macromolecular sequence analysis. Course intended primarily for graduate students. Spring. Vaisman.

673 [158] PROTEOMICS, PROTEIN IDENTIFICATION AND CHARACTERIZATION BY MASS SPECTROMETRY (1). Prerequisites, BIOC 650–653 or one semester of physical chemistry or permission of the instructor. A lecture module that introduces students to the basics of mass spectrometry as applied to protein science. Course intended primarily for graduate students.

Spring. Borchers (course director).

678 [155] ELECTRICAL SIGNALS FROM MACROMOLECULAR ASSEMBLAGES (2). Prerequisites, BIOC 650–653 or permission of the instructor. An intensive, six-hour per week introduction to the fundamentals of ion channel biophysics, including laboratory sessions to demonstrate principles and methods. Course intended primarily for graduate students. Fall. Oxford (course director), Cheney, Rosenberg, Pallotta, Stuart.

Courses for Graduates

700 CURRENT TOPICS IN RNA STRUCTURE, FUNCTION, AND TECHNOLOGY (2). Critical reading and discussion of current literature related to the study of RNA structure, RNA-protein interactions, novel RNA functions, RNA as a therapeutic target/agent and RNA methods.

701 [205] ANALYSIS IN BIOCHEMISTRY (3). Prerequisites, CHEM 430 or equivalent and permission of the coordinator. Seminar and critical study of modern research topics in biochemistry under the supervision of individual biochemistry faculty. Spring. Caplow and Fried, staff.

702 [207] ADVANCED BIOCHEMISTRY LABORATORY (2 or 4). Prerequisite, CHEM 430 or equivalent. Permission of the department required except for departmental majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. May be repeated two or more semesters for credit. Hours and credit to be arranged. Fall. Staff.

703 [207] ADVANCED BIOCHEMISTRY LABORATORY (2 or 4). Prerequisite, CHEM 430 or equivalent. Permission of the department required except for departmental majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. May be repeated two or more semesters for credit. Hours and credit to be arranged. Spring. Staff.

704 [260] SEMINARS IN BIOPHYSICS (2). Prerequisite, permission of the instructor. Students present seminars coordinated with the visiting lecturer series of the Program in Molecular and Cellular Biophysics. Fall and spring. Lentz, staff.

705 [208] ADVANCED BIOPHYSICS LABORATORY (2 or 4). Permission of the program required. Designed to introduce students in the Molecular and Cellular Biophysics Program to research methods. Minor investigative projects are conducted with advice and guidance of the staff. May be repeated two or more semesters for credit. Hours and credit to be arranged. Fall and spring. Staff.

711 [211] RESEARCH CONCEPTS IN BIOCHEMISTRY (2). Prerequisite, master's candidate in biochemistry and biophysics. A series of lectures and exercises on formulating a research plan to attack a specific scientific problem, and on presenting the research plan in the form of a grant proposal. Fall. G. Sancar (course director), staff.

712 [212] SCIENTIFIC WRITING (3). Prerequisite, doctoral candidate in biochemistry and biophysics. A course of lectures and workshops on the principles of clear scientific exposition with emphasis on the design and preparation of research grants. Fall. G. Sancar (course director), staff.

715 SCIENTIFIC PRESENTATION (1). Senior graduate students present original research results as a formal seminar. Feedback on presentation effectiveness and style will be provided by faculty instructors and classmates. Fall. Cook (codirector), Strahl (codirector), Kuhlman and Dokholyan.

721 [221] CELL REGULATION BY UBIQUITINATION (PHCO 721B) (2). Prerequisite, two semesters of biochemistry. Lecture and literature-based discussion course on ubiquitin-mediated regulation of hormone receptor signaling, trafficking and degradation. Spring (even-numbered years). Dohlman.

722A [222A] CELLULAR AND MOLECULAR NEUROBIOLOGY: INTRODUCTION (NBIO 722A, PHCO 722A, PHYI 722A) (2). Prerequisite, permission of the course director. Introductory section covers basic neurobiology, including neuronal cell biology, action potentials, synaptic potentials, molecular biology and neuroanatomy. Course meets for four weeks with six lecture hours per week. Fall. Stuart.

722B [222B] CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-RECEPTORS (NBIO 722B, PHCO 722B, PHYI 722B) (2). Prerequisite, permission of the instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for four weeks with six lecture hours per week. Fall. Neurobiology faculty.

722C [222C] CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (NBIO 722C, PHCO 722C, PHYI 722C) (2). Prerequisite, permission of the course director. The genesis of electrical impulses in the nervous system is considered with an emphasis on membrane potentials, voltage-gated ion channels and structural features of neurons that influence coding. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

723A [223A] CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-INTRACELLULAR SIGNALING (NBIO 723A, PHCO 723A, PHYI 723A) (2). Prerequisite, permission of the course director. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tryosine kinases. Course meets for five weeks with six lecture hours per week. Spring. Neurobiology faculty.

723B [223B] CELLULAR AND MOLECULAR NEUROBIOLOGY: PRESYNAPTIC MECHANISMS AND SYNAPTIC PLASTICITY (NBIO 723B, PHCO 723B, PHYI 723B) (2). Prerequisite, permission of the course director. Explores the mechanisms regulating the release of neurotransmitters from nerve terminals, including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Spring. Stuart and faculty.

The following seminar courses are designed for students majoring or minoring in biochemistry who wish to further their knowledge in particular areas. Unless otherwise stated, two semesters of biochemistry are prerequisites for seminar courses. Most of these courses are given in alternate years by interested staff members. Unless otherwise stated, these seminars may not be repeated for credit. Seminar courses provide teaching experience, which is required for a graduate degree in biochemistry and biophysics. In addition, the courses provide experience in giving a critical review of the current literature.

802 [244] SEMINAR IN THE PHASE PROBLEM IN X-RAY CRYSTALLOGRAPHY (2). Prerequisite, permission of the instructor. Image formation is treated from a quite general point of view, drawing from Fourier transform methods used in X-ray crystallography. Isomorphous replacement, multiple wavelength anomalous scattering and Bayesian direct methods are covered. One two-hour seminar a week. Spring (odd-numbered years.) Carter.

803 [245] SEMINAR ON CELL SIGNALING (2). Prerequisite, two semesters of biochemistry. Signal transduction in embryonic development. Spring (odd-numbered years). Maness.

804 [251] SEMINAR IN DNA-PROTEIN INTERACTIONS (2). Prerequisites, two semesters of biochemistry. Review of current literature on structural, thermodynamic and kinetic aspects of binding to DNA of proteins involved in replication, regulation, recombination and repair. Spring (odd-numbered years). A. Sancar.

805 [273] MOLECULAR MODELING (MEDC 805) (3). Prerequisites: MATH 231 and 232, CHEM 481. Introduction to computer-assisted molecular design, techniques and theory with an emphasis on the practical use of molecular mechanics and quantum mechanics programs. Fall. Tropsha (coordinator).

806 [276] MACROMOLECULAR MODELING (MEDC 806) (3). Prereq-

uisites, CHEM 430 or equivalent and permission of instructor. Applications of computational techniques to the study of macromolecular systems (protein and nucleic acid structure, molecular dynamics, free energy simulations, ligand docking). Practical use of macromolecular modeling programs in the laboratory. Two to three lecture hours and three laboratory hours per week. Spring. Tropsha (coordinator), staff.

807 [254] SEMINAR IN CELLULAR RESPONSES TO DNA DAMAGE (2). Prerequisites, graduate-level courses (one each) in molecular biology and biochemistry. A seminar course on the enzymology of DNA repair and damage tolerance and the regulation of genes involved in these processes. Both classic and recent literature are discussed. Spring. G. Sancar.

901, 902 [301, 302] RESEARCH IN BIOCHEMISTRY (3 or more). Prerequisite, permission of the department. Six or more hours a week throughout both semesters. (On demand.) Staff.

993 [393] MASTER'S THESIS (Var.). Staff.

994 [394] DOCTORAL DISSERTATION (Var.). Staff.

Curriculum in Bioinformatics and Computational Biology

bcb.unc.edu
TIMOTHY ELSTON, *Director*

Professors

Max Berkowitz, Theoretical and Computational Chemistry
Charles Carter, Protein Crystallography, Structural Polymorphism and Function
Jeff Dangl, Plant Genetics and Cellular Biology; Plant Disease Resistance and Cell Death Control
Henrik Dohlman, Regulators of G Protein Signaling
Gregory Forest, Mathematical Modeling of Mucociliary Transport Processes
Jeff Frelinger, Understanding and Manipulating the Genes of the Mouse and Human Major Histocompatibility Complexes
Joel Kingsolver, Evolutionary Biology, Population Ecology and Functional Biology of Insects
Terry Magnuson, Mammalian Genetics/Genomics/Development/Mouse Models of Human Disease
William Marzluff, Regulation of RNA Metabolism in Animal Cells
Jan Prins, High-Performance Computing, Algorithms, Programming Languages, Scientific Computing
Matthew Redinbo, Structural Studies of Dynamic Cellular Processes
Jack Snoeyink, Discrete and Computational Geometry Applications to Molecular Biology
John Sondek, Structural Biology of Signal Transduction
Alex Tropsha, Computational Analysis of Protein Structure and Drug Design

Associate Professors

Timothy Elston, Mathematical Modeling of Biological Networks
Bradley Hemminger, Bioinformatics, Medical Informatics, User Interface Design
Charles Perou, Genomic and Molecular Classification of Human Tumors to Guide Therapy.
Ivan Rusyn, Molecular, Biochemical and Genomics Approaches toward Understanding the Mechanisms of Chemical-Induced Carcinogenesis
David Threadgill, Disease Susceptibility, Mutagenesis, Colon Cancer, Genetic Engineering, Microarrays, Gut Flora
Todd Vision, Evolution of Genome Organization, Architecture of Complex Traits.
Wei Wang, Data Mining, Classification and Clustering Analysis of Gene-Expression Data and Protein Structures
Jennifer Webster-Cyriaque, Dental Ecology
Fred Wright, Statistical Genetics, Computational Genome Analysis
Fei Zou, Statistical Genetics of Complex Traits, Empirical Likelihood

Assistant Professors

Nikolay Dokholyan, Protein Folding, Design, and Evolution
Morgan Giddings, Systems Biology, Computational and Experimental Proteomics, Software Engineering, and Database Integration
Shawn Gomez, Systems Biology, Mathematical Modeling of Protein Interaction Networks
Mayetri Gupta, Statistical Analysis of Genomic Pattern Recognition
Ethan Lange, Statistical Genetics of Human Disease
Jason Lieb, Regulation Chromosomal Functions Such As Transcription, DNA Replication and Repair, Recombination and Chromosome Segregation
Yufeng Liu, Statistical Learning and Genomic Analysis
Garegin Papoian, Multi-Scale Computational Modeling, Protein Dynamics, Biophysical Chemistry
Maria Servedio, Mathematical Models Integrating Evolutionary Theories With Behavioral and Ecological Phenomena
Zefeng Wang, Splicing Regulation and Modulation

Modern biology, in this post-genome age, is being greatly enriched by an infusion of ideas from a variety of computational fields, including computer science, information science, mathematics, operations research and statistics. In turn, biological problems are motivating innovations in these computational sciences. There is a high demand for scientists who can bridge these disciplines. The goal of the Curriculum in Bioinformatics and Computational Biology (BCB) is to train such scientists through a rigorous and balanced curriculum that transcends traditional departmental boundaries.

Incoming students are expected to matriculate from a broad range of disciplines; thus, it is important to ensure that all students have a common foundation on which to build their BCB training. The first year is dedicated to establishing this foundation and training all students with a common set of core BCB courses. BCB students will also participate in three laboratory research rotations their first year and ultimately join a lab at the end of those rotations. Research work is done in the laboratory facilities of the individual faculty member and is supported primarily by faculty research grants.

Curriculum faculty have appointments in 18 departments in the School of Medicine, School of Dentistry, School of Public Health, School of Pharmacy, School of Information and Library Science and the College of Arts and Sciences. This level of diversity allows students a broad range of research opportunities.

Requirements for Admission for Graduate Work

Ideal BCB candidates should have an undergraduate degree in a biological, physical, mathematical or computational science. They must apply to the program through a new unified application program known as the Biological and Biomedical Sciences Program (BBSP). Students apply for graduate study in the biological or biomedical sciences at UNC-Chapel Hill. Students interested in any of the BBSP research areas apply to BBSP and those whose application portfolio places them highest on the admission list are asked to visit Chapel Hill for interviews. Students who are ultimately admitted to UNC make no formal commitment to a Ph.D. program. After completing their first year of study students leave BBSP and join a thesis lab and matriculate into one of 12 participating Ph.D. programs. During their first year BBSP students are part of small, interest-based groups led by several faculty members. These groups meet frequently and provide a research community for students until they join a degree granting program. Students are encouraged to apply as early as possible, preferably before January 1. (Applicants seeking a master's degree are not considered for admission.)

Requirements for the Ph.D. Degree

In addition to the dissertation requirements of The Graduate School (four full semesters of credit including at least six hours of doctoral dissertation, a written preliminary examination, an oral examination and a dissertation), students in the Curriculum in Bioinformatics and Computational Biology must meet the following requirements: complete one or two foundational courses (as needed), complete six of the seven BCB core courses, complete two elective courses (as determined by thesis advisor); participate in the BCB Colloquium as attendees the first and second years and as presenters in later years, act as teaching assistants for one of the BCB modules, attend the monthly seminar series sponsored by the Carolina Center for Genome Sciences and participate in the yearly BCB mini-symposium in the fall. Students are required to rotate through at least three laboratories before choosing a thesis advisor. It is strongly recommended that students attend national meetings in order to better understand how their research fits with progress in their field.

Financial Aid

Stipends for predoctoral students are available from an NIH predoctoral training grant and from the University. Tuition, student fees and graduate student health insurance are also covered by the training grant and the University.

Biological and Biomedical Sciences Program

www.med.unc.edu/bbsp
Virginia L. Miller, *Director*

The Biological and Biomedical Sciences Program (BBSP) of the University of North Carolina at Chapel Hill is an umbrella admissions and first-year program for 12 Ph.D. programs in the School of Medicine and the College of Arts and Sciences. The following programs are affiliated with the BBSP: Biochemistry and Biophysics, Bioinformatics and Computational Biology, Biology, Cell and Developmental Biology, Chemistry (Biological Chemistry Division), Genetics and Molecular Biology, Microbiology and Immunology, Molecular and Cellular Pathology, Neurobiology, Pharmacology, Physiology and Toxicology. Students interested in pursuing a Ph.D. in any of these programs must apply to the BBSP. For a complete list of faculty in the BBSP see the faculty page of the program's Web site at: webapps.med.unc.edu/BBSP/BBSPFaculty See individual program listings for more information about individual Ph.D. programs. These also can be accessed from the BBSP Web site.

A B.S. or B.A. degree is required for admission into the BBSP. It is generally expected that applicants will have a strong background in the biological sciences, chemistry, physics or mathematics. Only applicants with both strong academic records and prior research experience will be favorably considered. An interview, usually on campus, is required prior to admission.

During their first year, BBSP students are part of small, interest-based groups led by several faculty members. These groups meet weekly and provide a research community for students until they join a degree granting program. In these groups students will develop professional skills including the ability to give clear presentations, scientific writing, quantitative reasoning and the ability to ask questions/solve problems based in the biological sciences. The faculty in these groups will serve as an advisory committee that will assist students in selecting courses that meet their individual interests.

BBSP students will be able to choose from more than 330 faculty members as they pursue three required research rotations (each about 12 weeks in duration) in the fall and spring semesters of their first year. At the completion of the spring semester of the first year, each student will be asked to select an academic advisor who will provide guidance for his or her dissertation research training. The student will then join a Ph.D. program that the advisor is affiliated with and will complete coursework requirements during the second year.

All students enrolled in the BBSP program receive an annual stipend ($25,000 in 2008). Tuition, health insurance and fees are covered by the program.

Courses

The BBSP does not have a core curriculum or require students to take a particular set of courses. Students may take courses offered by any of the participating Ph.D. programs (see individual program listings for available courses). After joining a specific Ph.D. program students must fulfill the specific coursework and other requirements of that program.

Courses for Graduates

901 [301] RESEARCH IN BIOLOGICAL AND BIOMEDICAL SCIENCES (1–21). Prerequisite, enrollment in BBSP program. A research course for IBMS program students to carry on investigations in biomedical science. Fall and spring. Staff.

902 [302] SEMINAR IN BIOLOGICAL AND BIOMEDICAL SCIENCES (2). Prerequisite, enrollment in BBSP program. This course consists of seminars designed to acquaint the student with recent literature in biomedical sciences as it relates to research activity carried on in our departments. Fall and spring. Staff.

Department of Biology*

www.bio.unc.edu
WILLIAM M. KIER, *Chair*

**With recommendation of the department and the approval of the Administrative Board of The Graduate School, special courses and the direction of graduate studies are offered by the staff of the Institute of Marine Sciences, Morehead City, North Carolina.*

Professors

Albert S. Baldwin, Immunoglobulin Gene Expression
Victoria L. Bautch, Molecular Basis of Development
Kerry S. Bloom, Molecular Genetics
Jeffrey L. Dangl, Genetic and Molecular Analysis of Disease Resistance
Robert J. Duronio, Cell Cycle Control
Patricia G. Gensel, Paleobotany and Morphology
Albert K. Harris, Morphogenesis and Embryology
Alan M. Jones, Plant Molecular and Cellular Biology
Joseph J. Kieber, Plant Cell Biology
William M. Kier, Functional Morphology of Invertebrates, Biomechanics
Joel G. Kingsolver, Evolutionary Ecology and Physiological Ecology
Kenneth J. Lohmann, Neuroethology and Invertebrate Zoology
William F. Marzluff, Transcriptional and Posttranscriptional Regulation of RNA Metabolism, Cell Cycle Regulation during Development
A. Gregory Matera, RNA Processing: Biogenesis of Small Ribonucleoproteins
Ann G. Matthysse, Molecular Biology and Plant Pathology
Steven W. Matson, Molecular Biology and Biochemistry
Robert K. Peet, Plant Ecology
Mark A. Peifer, Developmental Genetics

Charles H. Peterson, Marine Ecology
David Pfennig, Ecology and Evolutionary Biology
Patricia J. Pukkila, Molecular Genetics
Edward D. Salmon, Cell Biology
Darrel W. Stafford, Developmental Biochemistry
Peter S. White, Plant Ecology
R. Haven Wiley, Animal Behavior

Associate Professors

Shawn C. Ahmed, Telomeres, DNA Change and Germline Immortality
Christina L. Burch, Experimental Evolution of Viruses
Gregory P. Copenhaver, Plant Genome Biology, Recombination, Centromeres
Robert P. Goldstein, Generation of Cell Diversity in Development
Jason D. Lieb, Specificity and Function in Protein-Genome Interactions
Jason W. Reed, Light Signal Transduction in Plants
Seth R. Reice, Community Ecology, Stream Ecology
Lillie L. Searles, Molecular Biology
Jeff Sekelsky, Meiotic Recombination, DNA Repair
Maria R. Servedio, Evolutionary Theory
Todd J. Vision, Evolutionary and Computational Genetics

Assistant Professors

Sabrina S. Burmeister, Neuroethology
Mara C. Duncan, Membrane Trafficking
Tyson Hedrick, Biomechanics and Animal Locomotion
Allen H. Hurlbert, Community Ecology, Biogeography
Corbin D. Jones, Evolutionary Genetics and Genomics
Sarah Liljegren, Molecular Genetic Analysis of Flower Development
Charles Mitchell, Disease Ecology
Steven Rogers, Cytoskeletal Filaments
Karin S. Pfennig, Ecology, Behavior, and Evolution
Kevin Slep, Cytoskeletal Structure and Dynamics
Keith Sockman, Neuroendocrine Control of Reproductive Flexibility

Research Professors

Sarah R. Grant, Pathogenicity Factors in Pseudomonas Syringae
Punita Nagpal, Plant Development
David Straight, Protein-Protein Interactions
James Umbanhowar, Ecosystem Stability and Function
Chris Willett, Molecular Population and Evolutionary Genetics
Elaine Yeh, Nuclear Division in Yeast

Associated Faculty

John Bruno, Marine Sciences
Stephen T. Crews, Molecular Genetics
Frank L. Conlon, Xenopus, Mesoderm, Heart, Tbox Genes
Michael A. Resnick, Molecular Genetics
Alan Weakley, Plant Systematics

Professors Emeriti

Edward G. Barry
Aristotle J. Domnas
J. Alan Feduccia
Lawrence I. Gilbert
Nelson G. Hairston
Max H. Hommersand
Rogers McVaugh
Donald W. Misch
Helmut C. Mueller
Clifford R. Parks
Tom K. Scott
Alan E. Stiven

The Department of Biology offers a program of study leading to a doctorof philosophy degree in biology. Master's degrees are only received by those students that have progressed far enough in the Ph.D. program, but cannot complete the program. Special departmental rules and guidelines for advanced degrees are available upon request.

Graduate Programs and Facilities

The Department of Biology is housed in three modern buildings and is equipped with modern instrumentation for research and research training in the biological disciplines represented by faculty areas for research. These include

Genetics and Molecular Biology: Genetics is both a discipline (the study of heredity) and an experimental approach (manipulation of genes or the genetic material). Today, most geneticists work at the molecular level by manipulating RNA or DNAor entire genomes. Our group is strong in both model organism genetics and genomics. Areas of emphasis include: biochemistry and molecular biology, chromosome biology, developmental genetics, protein synthesis, enzyme mechanics and plant genetics.

Cell Biology, Development and Physiology: Developmental biologists address the mechanisms through which cells acquire specialized functions to elicit complex body plans. These features are accomplished in part through cell proliferation, migration and shape changes. Our department has a strong research program in these areas, which are major topics in cell biology, as well as in other aspects of developmental biology. Areas of emphasis include: cytology, mitotic and meiotic mechanisms, histochemistry, invertebrate endocrinology, experimental morphogenesis, morphogenetic movements, tissue culture, hormones, plant development, signal transduction, functional morphology, biomechanics and neuroethology, and membrane functions.

Evolutionary Biology: Evolution is inherited change in the characteristics of populations over time. Two major goals of evolutionary biology are to explain the incredible fit of organisms to their environment and the origins of diversity. To this end, we investigate the genetic and ecological mechanisms that shape adaptation with a strong focus on processes that contribute to the origin of species.

Ecology: The study of how organisms interact with each other and their physical environment. Our group has strength in behavioral, conservation, community and evolutionary ecology. Areas of emphasis include population biology, life histories and ecosystem phenomena in terrestrial freshwater and marine systems.

Behavior and *Organismal Biology:* Organismal biologists seek to understand the remarkable diversity of life forms on Earth by analyzing organismal structure and function. We take an integrative approach to this research, combining analyses at levels ranging from molecules to whole organisms. Our group also endeavors to understand the evolution and mechanisms of behavior. We use theoretical, observational and experimental approaches in a variety of species, from crawling behavior in sea slugs to social communication in primates. Areas of emphasis include social and mating systems of vertebrates, communication, ecology and ontogeny of behavior, predator-prey interactions, marine ecology and oceanography, comparative physiology, neuroethology, and biomechanics.

Plant Biology: We have an active and diverse group that studies features specific to plants or that uses plant models to address questions of broad interest. Areas of emphasis include: host-pathogen interactions, signal transduction, development, and genomics and chromosome biology.

After completing required course work in the department, students in marine biology have access to the research facilities of the Institute

of Marine Sciences, Morehead City, North Carolina. By cooperative arrangements, deep water research can be carried out through the use of the research vessel of the Duke University Marine Laboratory.

Interdepartmental degree programs in genetics, ecology, neurobiology and marine science offer unusual opportunities for special training through participation of staff from the Department of Biology and many other departments in arts and sciences and health affairs.

The **John N. Couch Biology Library** has more than 70,000 volumes and receives more than 1,200 serials related to fields of research in the department. The collection includes treatises, monographs, symposium volumes, reprints, and standard and classical works of research and historical importance. The nearby Health Sciences Library contains additional biological references.

A major research asset is the location of the University, which makes the varied flora and fauna of the **Appalachian Mountains, Piedmont Plateau, Coastal Plain** and **Atlantic Coast** accessible for research and instruction. The department operates a small field station a few miles from the Chapel Hill campus in the Mason Farm Biological Reserve, which includes several hundred acres of upland and floodplain habitats.

The **Coker Arboretum** and the **North Carolina Botanical Garden** are of value to students in the study of special problems. The Herbarium, containing more than 600,000 specimens, is especially rich in collections of the vascular plants and fungi of the Carolinas and the Southeastern United States.

The **Highlands Biological Station**, administered for the University system by Western Carolina University, is located in the biologically rich mountains at Highlands, North Carolina. Graduate courses offered cover various parts of the mountain biota. Credit may be obtained through UNC-Chapel Hill or Western Carolina University. A limited amount of research support is available on a competitive basis. (See the annual announcement of the Highlands Biological Station.)

The University is a member of the **Organization for Tropical Studies (OTS)**. Financial support is available for students attending OTS courses in tropical ecology in Costa Rica.

Additional information about the graduate program including instructions for application is available at www.bio.unc.edu.

Fellowships and Assistantships

Application for admission and graduate appointments, accompanied by credentials and Graduate Record Examination scores, and optionally the Advanced Biology score, should be submitted for receipt no later than January 1 (date subject to change at the discretion of the department). Instructions for applying to the biology graduate program can be found on the departmental Web site (www.bio.unc.edu).

All outstanding prospective graduate students who apply for admission are automatically considered for University fellowships.

More than 45 teaching assistantships are open to graduate students. Duties of assistants include preparation for and supervision of laboratory and recitation sections of undergraduate courses. Duties usually require 13–15 hours per week including six contact hours in classes and six to nine hours of preparation or other services associated with instruction.

Research assistantships are available. Salaries and duties are variable as determined by the research needs of faculty supervising the work. Applications for these appointments must be made personally to faculty members directing grant-supported research.

The following awards are specifically for graduate students in the Biology Department.

- The Alma Holland Beers Scholarships are awarded annually to support summer research of students in botany. They are nonservice awards.
- The William Chambers Coker Fellowship is awarded annually to a student or students in the final years of work toward a doctor of philosophy in a botanical field. This is a nonservice award that carries with it an additional supplement for tuition and fees.
- The Mrs. W. C. Coker Fellowship is awarded annually to an outstanding first-year graduate student in plant biology. This is also a nonservice award that carries with it an additional supplement for tuition and fees.
- The H. V. Wilson Marine Scholarship is awarded annually for summer work at a marine laboratory. It is a nonservice award.

Courses for Graduates and Advanced Undergraduates

The stated prerequisites should be interpreted to read "or equivalent" and may be waived by the course instructor for students who are adequately prepared.

321 [124] INTRODUCTION TO IMMUNOLOGY (3). Prerequisites, BIOL 202, 205, and permission of the instructor. This course provides a general overview of the evolution, organization and function of the immune system. Instruction will be inquiry-based with extensive use of informational and instructional technology tools.

324 [135] MOLECULAR BASIS OF DISEASE (3). Prerequisites, BIOL 202 and BIOL 205, or permission of the instructor. This course covers the molecular mechanisms of human diseases, including genetic diseases, infectious diseases, immunodeficiencies, nutritional disorders, cancer, metabolic diseases, cardiovascular diseases and neurological disorders.

350 [126] OCEANOGRAPHY (MASC 401, ENVR 417, GEOL 403) (3). Prerequisite, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record and the history of oceanography. Term paper. Intended for students with college science background; other students should see GEOL 103. Three lecture hours a week. Fall, spring. Staff (Marine Sciences).

410 PRINCIPLES AND METHODS OF TEACHING BIOLOGY (4). Prerequisites, two of the three biology core courses: BIOL 201, 202 and/or 205. This course will develop the knowledge and skills teachers need to implement inquiry-based biology instruction: rich, conceptual knowledge of biology and mastery of inquiry-based teaching methods. Fall, spring. Coble.

422 [108] MICROBIOLOGY (3). Prerequisite, BIOL 202 or permission of the instructor. Bacterial form, growth, physiology, genetics and diversity. Bacterial interactions including symbiosis and pathogenesis (animal and plant). Use of bacteria in biotechnology. Brief introduction to fungi and viruses. Fall. Matthysse.

422L [108L] MICROBIOLOGY LABORATORY (1–2). Pre- or corequisite, BIOL 422. Sterile technique, bacterial growth and physiology, bacterial genetics, bacteriophage and bacterial diversity. Fall. Matthysse.

423L LABORATORY EXPERIMENTS IN GENETICS (4). Prerequisite, BIOL 205. Experiments using a range of organisms—from bacteria to Drosophila, higher plants and man—to sample organismal and molecular genetics. One lecture hour, four laboratory hours. Spring. Grant.

425 [122] HUMAN GENETICS (GNET 425) (3). Prerequisite, BIOL 202. Pedigree analysis, inheritance of complex traits, DNA damage and repair, human genome organization, DNA fingerprinting, the genes of hereditary diseases, chromosomal aberrations, cancer and oncogenes, immunogenetics and tissue transplants. Three lecture hours a week. Spring. Sekelsky, Copenhaver.

426 [134] BIOLOGY OF BLOOD DISEASES (PATH 426) (3). Prerequisite, BIOL 205 or permission of the instructor. An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases, including malignant neoplasms, anemias, hemophilias, thrombophilias,

atherosclerosis and viral infections. Fall. Church (Pathology).

427 [127] HUMAN DIVERSITY AND POPULATION GENETICS (3). Prerequisites, BIOL 202 and 201 or permission of the instructor. This course investigates the facts, methods and theories behind human population genetics, evolution and diversity. Specifically, it addresses questions of human origins, population structure and genetic diversity. Fall. C. Jones.

430 [130] INTRODUCTION TO BIOLOGICAL CHEMISTRY (CHEM 430) (3). Prerequisites, CHEM 262 or 262H, CHEM 262L or 263L, and BIOL 101. The study of cellular processes including catalysis, metabolism, bioenergetics and biochemical genetics. The structure and function of biological macromolecules involved in these processes is emphasized. Fall and spring. Biological Chemistry faculty.

434 [164] MOLECULAR BIOLOGY (3). Prerequisites, CHEM 261 and BIOL 202. Emphasis is on prokaryotic molecular biology, plasmids, lambda-phage and single-strand phages. Three lecture hours a week. Spring. Searles.

436 [131] ENDOCRINOLOGY (3). Prerequisite, BIOL 205 or 252. Principles of neuroendocrine and endocrine systems of vertebrates and selected invertebrates with consideration of the anatomy and physiology of glands of internal secretion. Hormone chemistry and interendocrine relationships are also emphasized. Three lecture hours a week..

438 [190] FRONTIERS IN CELL AND MOLECULAR BIOLOGY (4). Prerequisites, two courses in biology and permission of the instructor. Does not count toward a major in biology. Available by correspondence. Fall.

439 [165] INTRODUCTION TO SIGNAL TRANSDUCTION (3). Prerequisites, BIOL 101, 202 and 205. This course presents an introduction to signal transduction pathways used by higher eukaryotes. Several signaling paradigms will be discussed to illustrate the ways that cells transmit information. Three lecture hours per week.

441 [104] VERTEBRATE EMBRYOLOGY (3). Prerequisite, BIOL 252 or 205. Principles of development with special emphasis on gametogenesis, fertilization, cleavage, germ layer formation, organogenesis and mechanisms, with experimental analysis of developmental processes. Three lecture hours a week. Spring. Harris.

441L [104L] VERTEBRATE EMBRYOLOGY LABORATORY (1). Pre- or corequisite, BIOL 441. Descriptive and some experimental aspects of vertebrate development. Three laboratory hours a week. Spring. Harris.

443 [144] DEVELOPMENTAL BIOLOGY (3). Prerequisites, BIOL 202 or 205 and CHEM 261. An experimental approach to an understanding of animals and plants. The approach covers developmental processes, molecular, genetic, cell biological and biochemical techniques, with an emphasis on the molecules involved in development.

445 [169] CANCER BIOLOGY (3). Prerequisites, BIOL 202 and 205. Selected examples will be used to illustrate how basic research allows us to understand the mechanistic basis of cancer and how these insights offer hope for new treatments. Spring. Duronio, Peifer.

446 [166] UNSOLVED PROBLEMS IN CELLULAR BIOLOGY (3). Prerequisite, BIOL 205. A survey of areas of current interest in cytology, embryology and genetics with concentration on problems that remain unsolved but that appear to be near solution. Three lecture and discussion hours a week. Fall. Harris.

447 [129] LABORATORY IN CELL BIOLOGY (4). Prerequisite, grade of C or better in BIOL 205. Modern methods to study cells, technical skills necessary for research in cell and molecular biology, knowledge of good lab practice, operation of technical instrumentation. Three lecture and three laboratory hours a week. Spring. A. Jones.

448 [167] ADVANCED CELL BIOLOGY (3). Prerequisite, BIOL 205. An advanced course in cell biology, with emphasis on the biochemistry and molecular biology of cell structure and function. Three lecture hours a week. Fall. Kieber.

450 [121] INTRODUCTION TO NEUROBIOLOGY (3). Prerequisite, BIOL 205. Survey of neurobiological principles in vertebrates and invertebrates, including development, morphology, physiology and molecular mechanisms. Three lectures a week. Fall. Lohmann.

451 [120] COMPARATIVE PHYSIOLOGY (3). Prerequisites, BIOL 101 and 101L, PHYS 104 and PHYS 105. An examination of the physiology of animals using a comparative approach. Both invertebrate and vertebrate animals are discussed in order to elucidate general principles. Spring. Kier, Hedrick.

452 [170] MATHEMATICAL AND COMPUTATIONAL MODELS IN BIOLOGY (MATH 452) (4). Prerequisites, BIOL 201 and 202, MATH 231 and either MATH 232 or STOR 155. This course will introduce analytical, computational and statistical techniques, such as discrete models, numerical integration of ordinary differential equations, and likelihood functions, to explore topics from various fields of biology. Lab is included. Fall. Servedio, Hedrick.

453 [150] ANIMAL SOCIETIES AND COMMUNICATION (3). Pre- or corequisite, BIOL 278. Comparative review of animal societies; diversity of social structure, social dynamics, communication, ecology and evolution of social organization. Three lecture hours a week. Fall. (Alternate years.) Wiley, Sockman.

454 [158] EVOLUTIONARY GENETICS (3). Prerequisites, BIOL 201 and 202 or permission of the instructor. The roles of mutation, migration, genetic drift and natural selection in the evolution of the genotype and phenotype. Basic principles are applied to special interest topics. Three lecture hours a week. Fall. (Alternate years). Vision.

455 [154] BEHAVIORAL NEUROSCIENCE (3). Prerequisite, BIOL 205 or permission of the instructor. The neurobiological basis of animal behavior at the level of single cells, neural circuits, sensory systems and organisms. Lecture topics range from principles of cellular neurobiology to ethological field studies. Spring. Burmeister.

456 [157] PROBLEMS IN VERTEBRATE EVOLUTION (GEOL 456) (3). Prerequisites, BIOL 276 or permission of the instructor. A study of the major transitions in vertebrate evolution and associated problems in evolutionary biology, structural change, paleoecology, biogeography and earth history, physiology and behavior. Three lecture hours a week..

457 [148] MARINE BIOLOGY (MASC 442) (3). Prerequisite, MASC 101, BIOL 201 or 475, or permission of the instructor. A survey of plants and animals that live in the sea: characteristics of marine habitats, organisms and the ecosystems will be emphasized. Marine environment, the organisms involved and the ecological systems that sustain them. Fall.

458 SENSORY NEUROBIOLOGY AND BEHAVIOR (3). Prerequisite, BIOL 205. An exploration of sensory systems and sensory ecology in animals. Topics range from neurophysiological function of sensory receptors to the role of sensory cues in animal behavior.

459 [195] FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1-4). Prerequisite, BIOL 101 or equivalent, or permission of the instructor. Content will vary. Summer field biology at the Highlands Biological Station will generally focus on the special faunal and floristic processes and patterns characteristic of the southern Appalachian mountain region. Five lecture and three to five laboratory and field hours per week, depending on credit. Summer. Staff.

461 [112] FUNDAMENTALS OF ECOLOGY (ECOL 461, ENST 461) (4). Prerequisite, BIOL 201. Students will develop a comprehensive understanding of the field of ecology, including modern and emerging trends in ecology. They will develop literacy in the fundamental theories and models that capture ecological processes; emphasis will also be placed on the relevance of ecology and ecological research for human society.

462 [146] MARINE ECOLOGY (MASC 440) (3). Prerequisite, BIOL 201 or 475. Survey of ecological processes that structure marine communities in a range of coastal habitats. Course emphasizes experimental approaches to addressing basic and applied problems in marine systems. Spring. Bruno.

463 FIELD ECOLOGY (4). Prerequisite, BIOL 201. Application of ecological theory to terrestrial and/or freshwater systems. Lectures will acquaint students with these systems and emphasize quantitative properties of interacting

population and communities within them. The required laboratory will teach techniques and methodology applicable for analysis of these systems. Individual and group projects will emphasize experimental testing of ecological theory in the field. Two lecture and six field hours a week. Spring. (Alternate years.) Reice.

469 [151] BEHAVIORAL ECOLOGY (3). Prerequisite, BIOL 201 or 278. Behavior as an adaptation to the environment. Evolution of behavioral strategies for survival and reproduction. Optimality and games that animals play. Three lecture hours a week. Spring. (Alternate years.) K. Pfennig.

471 [132] EVOLUTIONARY MECHANISMS (4). Prerequisites, BIOL 202 and 201 or permission of the instructors. Introduction to mechanisms of evolutionary change, including natural selection, population genetics, life history evolution, speciation, and micro- and macroevolutionary trends. Three lecture hours plus two hours of laboratory/recitation per week. Fall. D. Pfennig, Burch.

472 [103] INTRODUCTION TO PLANT TAXONOMY (4). Prerequisites, BIOL 271 and/or 272 or permission of the instructor. Introduction to the taxonomy of vascular plants. Principles of classification, identification, nomenclature and description. Laboratory and field emphasis on phytography, families, description, identification and classification of vascular plant species. Three lecture and three laboratory hours a week.

475 [105] BIOLOGY OF MARINE ANIMALS (4). Prerequisites, BIOL 101 and 101L and one additional course in biology. An introduction to the major animal phyla emphasizing form, function, behavior, ecology, evolution and classification of marine invertebrates. Three lecture and three laboratory hours per week. Spring. (Alternate years). Lohmann.

476 [114] AVIAN BIOLOGY (3). Prerequisites, BIOL 101 and 101L and one additional course in biology. A study of avian evolution, biogeography, ecology and behavior with emphasis on North Carolina avifauna. Three lecture hours a week. Fall. (Alternate years.) Wiley.

476L [114L] AVIAN BIOLOGY LABORATORY (1). Pre- or corequisite, BIOL 476. Techniques for the study of avian evolution, ecology and behavior with emphasis on North Carolina birds. Three laboratory or field hours a week, including one or two weekend field trips. Fall. (Alternate years.) Wiley.

478 [110] INVERTEBRATE PALEONTOLOGY (GEOL 478) (4). Prerequisite, GEOL 159 or BIOL 101 or permission of the instructor. Introduction to the principles, methods of analysis, and major controversies within paleontology. Examination of the fossil record and its application to problems in evolutionary biology, paleoecology, paleoclimatology and general Earth history. Fall. Carter.

490 [175] SPECIAL TOPICS (3). Permission of the instructor. Content will vary. Three lecture and discussion hours per week by visiting and resident faculty. Fall and spring. Staff.

501 [176] ETHICAL ISSUES IN LIFE SCIENCES (3). Prerequisites, BIOL 202, 205 and permission of the instructor. A consideration and discussion of ethical issues in life sciences including cloning humans, genetic engineering, stem cell research, organ transplantation and animal experimentation. Counts as a course numbered below 400 for biology major requirements.

514 [133] EVOLUTION AND DEVELOPMENT (3). Prerequisites, BIOL 201, 202 and 205. The course examines the mechanisms by which organisms are built and evolve. In particular, it examines how novel and complex traits and organisms arise from interactions among genes and cells. Three lecture hours per week. Fall. D. Pfennig, Goldstein.

522 [109] BACTERIAL GENETICS (3). Prerequisite, BIOL 422. Genetics of eubacteria with emphasis on molecular genetics including regulation of gene expression, transposons, operons, regulons, plasmids, transformation and conjugation. Spring. Matthysse.

524 [424] STRATEGIES OF HOST-MICROBE INTERACTIONS (3). Prerequisites, BIOL 205 and 422 or equivalents. There is great variety in how microbes colonize and live with their hosts. The course will summarize strategies of pathogenicity, symbiosis, commensalism and mutualism. Evolutionary, cellular and molecular aspects will be analyzed.

526 [162] COMPUTATIONAL GENETICS (4). Prerequisites, BIOL 202, COMP 101 and STOR 155. A study of the concepts underlying the bioinformatic tools used in genetics. Topics include alignment, gene finding, expression analysis, mapping, phylogenetics and measuring sequence divergence and polymorphism. Three lecture and two laboratory hours per week. Fall. (Alternate years.) Vision.

529 [429] CLINICAL AND COUNSELING ASPECTS OF HUMAN GENETICS (GNET 635) (3). Prerequisites, BIOL 425 and permission of the instructor. Topics in clinical genetics including pedigree analysis, counseling/ethical issues, genetic testing, screening and issues in human research are taught in a small group format. Active student participation is expected. Three lecture hours per week.

535 [435] MOLECULAR BIOLOGY TECHNIQUES (4). Permission of the instructor; BIOL 434 recommended. Experiments with bacterial phage, nucleic acid isolation and properties, recombinant DNA techniques and DNA sequencing. Additional hours in laboratory will be necessary to complete assignments. Fall. Stafford.

542 [188] LIGHT MICROSCOPY FOR THE BIOLOGICAL SCIENCES (3). Prerequisites, BIOL 205 and permission of the instructor. Introduction to various types of light microscopy, digital and video imaging techniques, and their application in biological sciences. Spring. (Alternate years.) Salmon, Bloom.

551 [155] COMPARATIVE BIOMECHANICS (3). Prerequisites, BIOL 101 and 101L, PHYS 104 and 105. The structure and function of organisms in relation to the principles of fluid mechanics and solid mechanics. Fall. (Alternate years.) Kier.

553 [152] PLANT ANATOMY (5). Prerequisite, BIOL 274. Introduction to the development and comparative anatomy of vascular plants. Practice in methods of anatomical microtechnique. Three lecture and four laboratory hours a week. Fall. (On occasion.) Staff.

554 [153] COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS (5). Prerequisite, BIOL 274. Comparative morphology and evolutionary relationships of the tracheophyta. Both living and fossil forms will be considered. Three lecture and four laboratory hours a week. Spring. (Alternate years.) Gensel.

555 [181] PALEOBOTANY (GEOL 555) (4). Prerequisites, BIOL 101/101L and permission of the instructor. An introduction to the morphology, stratigraphic occurrence and evolutionary relationships of fossil plants. Both macrofossils and microfossils will be considered. Three lecture and three laboratory hours a week. Fall. (Alternate years.) Gensel.

561 [143] ECOLOGICAL PLANT GEOGRAPHY (3). Prerequisite, BIOL 101 or GEOG 110. Description of the major vegetation types of the world including their distribution, structure and dynamics. The principal causes for the distribution of plant species and communities, such as climate, soils and history will be discussed. Fall. (Alternate years.) Peet.

562 [141] STATISTICS FOR ENVIRONMENTAL SCIENTISTS (ECOL 562, ENST 562) (4). Prerequisite, STOR 155 or equivalent. Introduction to the application of quantitative and statistical methods in environmental science, including environmental monitoring, assessment, threshold exceedance, risk assessment and environmental decision making.

563 [145] STATISTICAL ANALYSIS IN ECOLOGY AND EVOLUTION (ECOL 563, ENST 563) (4). Prerequisites, MATH 231 and STOR 151. Application of modern statistical analysis and data modeling in ecological and evolutionary research. Emphasis is on computer-intensive methods and model-based approaches. Familiarity with standard parametric statistics is assumed.

564 [149] ECOSYSTEM STRUCTURE AND FUNCTION (3). Prerequisite, BIOL 201 or a course in limnology or geochemistry. Pattern and process in natural ecosystems, with stress on comparative approaches to ecosystems and analysis. Topics include primary and secondary productivity, nutrient cycling and the biogeochemistry of aquatic and terrestrial ecosystems. Three lecture hours a week. (On occasion.) Staff.

564L [149L] ECOSYSTEM STRUCTURE AND FUNCTION LABORATORY (1). Pre- or corequisites, BIOL 564 and permission of the instructor. Use of data to generate empirical models of ecosystem patterns or processes. Individual research projects. Three laboratory hours a week. Fall or spring. (On occasion.) Staff.

565 [184] CONSERVATION BIOLOGY (3). Prerequisite, BIOL 201. The application of biological science to the conservation of populations, communities and ecosystems, including rare species management, exotic species invasions, management of natural disturbance, research strategies and preserve design principles. Spring. White.

567 [467] EVOLUTIONARY ECOLOGY (3). Prerequisite, BIOL 471 or permission of the instructor. Advanced topics in the evolution of form and function. May include issues in life-history evolution, evolutionary physiology, evolutionary morphology and the evolution of complexity. Three lecture hours per week.

568 DISEASE ECOLOGY AND EVOLUTION (3). Prerequisites, BIOL 201, MATH 231 and one course above 400 in ecology or evolution. An advanced class covering the causes and consequences of infectious disease at the levels of whole organisms, populations, communities and ecosystems.

579 [183] ORGANISMAL STRUCTURE AND DIVERSITY IN THE SOUTHERN APPALACHIAN MOUNTAINS (4). Prerequisite, general biology, ecology or permission of the instructor. An examination of the field biology of selected fungi, plants or animals of the Appalachian Mountains. The morphology, taxonomy, ecology, life history and behavior of the organisms will be explored both in the laboratory and in the field.

With approval of the instructor and The Graduate School, biology majors who need fewer than 15 hours to complete the bachelor's degree and who have at least a B average in biology courses may take one or two courses at the 600-800 level for the purpose of later receiving graduate credit.

Courses for Graduates

621 [161] PRINCIPLES OF GENETIC ANALYSIS I (GNET 621) (3). Prerequisite for undergraduates, BIOL 202. For graduate students, an undergraduate genetics course or permission of the instructor. Genetic principles of genetic analysis in prokaryotes and lower eukaryotes. Fall. Copenhaver, Sekelsky, Ahmed.

622 [168] PRINCIPLES OF GENETIC ANALYSIS II (GNET 622) (4). Prerequisite, BIOL 621 or GNET 621. Principles of genetic analysis in higher eukaryotes; genomics. Spring. Staff.

624 [160] DEVELOPMENTAL GENETICS (GNET 624) (3). Prerequisites, BIOL 202, 205 and permission of the instructor required for undergraduates. Genetic and molecular control of plant and animal development. Extensive reading from primary literature. Fall. Bautch.

625 [270] SEMINAR IN GENETICS (GNET 625) (2). Permission of the instructor. Current and significant problems in genetics. May be repeated for credit. Fall and spring. Bautch, Copenhaver, C. Jones, Peifer, Pukkila, Searles, Sekelsky..

631 [178] ADVANCED MOLECULAR BIOLOGY I (BIOC 631, GNET 631, MCRO 631, PHCO 631) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics and permission of the instructor. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours a week. Fall. Griffith, Ramsden, Sancar.

632 [179] ADVANCED MOLECULAR BIOLOGY II (BIOC 632, GNET 632, MCRO 632, PHCO 632) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics and permission of the instructor. RNA structure, function and processing in biological systems including transcription, gene regulation, translation and oncogenes. Three lecture hours a week. Spring. Baldwin, Marzluff, Strahl.

639 [272] SEMINAR IN PLANT MOLECULAR AND CELL BIOLOGY (2). Permission of the instructor. May be repeated for credit. Current and significant problems in plant molecular and cell biology are discussed in a seminar format. Fall or spring. Dangl, A. Jones, Kieber, Liljegren.

642 [177] CURRENT TOPICS IN CELL DIVISION (3). Prerequisite, BIOL 205. An advanced course in cell and molecular biology integrating genetic, biochemical and structural aspects of the cell cycle. Principles derived from a variety of biological systems. Extensive reading of classic papers as well as recent literature.

648 [282] PALYNOLOGY (5). Prerequisite, permission of the instructor. A consideration of various aspects of palynology, including the morphology, structure, development, systematics, evolution, preparation techniques and analysis of living and fossil pollen grains, spores and other palynomorphs. Two lecture and six laboratory hours a week. Fall or spring. (Alternate years.) Gensel.

649 [254] SEMINAR IN CELL BIOLOGY (2). Prerequisite, BIOL 205 or permission of the instructor. May be repeated for credit. Fall or spring. Bloom, Goldstein, Harris, Salmon.

657 [140] BIOLOGICAL OCEANOGRAPHY (ENVR 520, MASC 504) (4). Prerequisite, BIOL 201 or 475 or permission of the instructor. Physical, chemical and biological factors characterizing estuarine and marine environments. Emphasizes factors controlling animal and plant populations. Includes experimental approaches and methods of analysis, sampling and identification. Three lecture and two recitation hours a week.

659 [258] SEMINAR IN EVOLUTIONARY BIOLOGY (2). Prerequisite, BIOL 471 or permission of the instructor. Advanced topics in evolutionary biology. Fall and spring. Burch, Kingsolver, D. Pfennig, K. Pfennig, Servedio, Willett, Vision.

661 [142] PLANT ECOLOGY (4). Prerequisite, BIOL 201. Consideration of terrestrial, vascular plant ecology including environmental physiology, population dynamics and community structure. Laboratory stresses collection and interpretation of field data. Three lecture and three laboratory hours a week. Fall. (Alternate years.) Peet.

662 [247] FIELD PLANT GEOGRAPHY (2). Prerequisites, BIOL 661 or 561 and permission of the instructor. Intensive literature and field study of the plant geography and ecology of a selected region. Weekly seminar-style discussion followed by approximately nine days of field experience. May be repeated for credit. Spring. (Alternate years.) Peet.

663 [185] POPULATION ECOLOGY (3). Prerequisite, BIOL 201. An advanced treatment of topics in animal population and community ecology, stressing analytical and interpretation approaches. Topics will vary from year to year, and the course may be repeated with credit. Three lecture and discussion hours a week.

663L [185L] LABORATORY IN POPULATION ECOLOGY (1). Pre- or corequisites, BIOL 663 and permission of the instructor. Methodology in the analysis and interpretation of population and community phenomena. Three laboratory and field hours a week.

666 [186] COMMUNITY AND SYSTEMS ECOLOGY (3). Prerequisite, BIOL 201. A holistic approach to ecology. State-space modeling of ecological processes. Other topics will vary but may include spatial and temporal heterogeneity in communities and ecosystems, disturbance theory, decomposition, community structure and function, freshwater ecology. Spring. (Alternate years.) Reice.

666L [186L] COMMUNITY AND SYSTEMS ECOLOGY LABORATORY (1). Pre- or corequisite, BIOL 666. Community and/or ecosystem modeling and computer simulation. Experimental analyses and validation in the field. Individual and group projects. Three laboratory and field hours a week. Spring. (Alternate years.) Reice.

669 [255] SEMINAR IN ECOLOGY (ECOL 669) (2). Prerequisite, BIOL 201 or permission of the instructor. May be repeated for credit. Fall and spring. Bruno, Peet, Reice, White.

758 [159] MOLECULAR POPULATION BIOLOGY (MASC 742) (4). Prerequisites, BIOL 471 and permission of the instructor. Hands-on training, experience, and discussion of the application of molecular genetic tools to questions of ecology, evolution, systematics and conservation. Lab/recitation/fieldwork is included and contributes three credit hours to the course.

822 [275] STUDENT RESEARCH SEMINAR (GNET 703) (1). A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based on their individual dissertation projects. Lectures are privately critiqued by fellow students and genetics faculty. Required of all candidates for the degree in genetics. Fall and spring. Genetics faculty.

831 [252] SEMINAR IN INSECT PHYSIOLOGY, BIOCHEMISTRY AND ENDOCRINOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Current topics and discussion in insect physiology, biochemistry and endocrinology.

832 [264] SEMINAR IN MOLECULAR BIOLOGY (2). Prerequisite, BIOL 202 or permission of the instructor. May be repeated for credit. Fall or spring. Bautch, Bloom, Stafford.

841 [253] SEMINAR IN EMBRYOLOGY (2). Prerequisite, BIOL 205 or permission of the instructor. May be repeated for credit. Fall or spring. Bautch, Harris.

842 [268] SEMINAR IN CELL BIOLOGY AND BIOCHEMISTRY (2). Prerequisite, permission of the instructor or research director.

850 [290] SEMINAR IN NEUROBIOLOGY (NBIO 850, PHCO 850, PHYI 850) (3). Prerequisite, permission of the director of the neurobiology curriculum. An intensive consideration of selected topics and problems in neurobiology. The course focuses on the development of presentation and evaluation skills of the trainees. Six credit hours required for neurobiology graduates. Spring. Faculty of the neurobiology curriculum.

852 [269] SEMINAR IN PLANT SYSTEMATICS (2). Prerequisite, permission of the instructor or the research director. Fall and spring. Gensel.

853 [271] SEMINAR IN PLANT MORPHOLOGY AND ANATOMY (2). Prerequisite, permission of the research director. Fall and spring. Gensel.

854 [266] SEMINAR IN NEUROPHYSIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Kier, Lohmann, staff of neurobiology curriculum.

855 [256] SEMINAR IN INVERTEBRATE ZOOLOGY (2). Prerequisite, BIOL 475 or permission of the instructor. May be repeated for credit. Fall or spring. Kier, Lohmann.

856 [257] SEMINAR IN VERTEBRATE EVOLUTIONARY BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit.

857 [259] SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (NBIO 857) (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Lohmann, Wiley.

858 [260] SEMINAR IN COMPARATIVE PHYSIOLOGY (NBIO 858) (2). Prerequisite, BIOL 451 or permission of the instructor. Fall or spring. Lohmann.

859 [265] SEMINAR IN MARINE BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Kier.

890 [250] SPECIAL SEMINAR (2). Prerequisite, permission of the instructor. Consideration of special topics in biology. May be repeated for credit. Fall or spring (as occasion demands). Staff.

891 [251] GRADUATE SEMINAR IN BIOLOGY (2). Prerequisite, graduate standing or permission of the instructor. A course to provide public lecture experience to advanced biology students. Students present individual research seminars based upon their dissertation projects. Lectures are critiqued by fellow students and biology faculty. Required of all candidates for the degree in biology. Fall and spring. Staff.

Courses numbered 900 and above are designed for applicants for advanced degrees. Each course requires permission of the instructor or the research director. Each may be repeated for two or more semesters for credit.

901 [299] INTRODUCTION TO GRADUATE RESEARCH (Var.). Graduate research for six weeks in two laboratories. Designed primarily to acquaint first-year students with research techniques and to assess their propensity for research. Arranged by mutual agreement of students and faculty members during fall orientation. May be repeated once for credit. Six to nine hours per week. Fall and spring. Staff.

921 [305] RESEARCH IN GENETICS (GNET 905) (2 or more). Ahmed, Bautch, Duronio, Goldstein, Liljegren, Matthysse, Matson, Pukkila, Searles, Sekelsky, Vision.

931 [308] RESEARCH IN MOLECULAR BIOLOGY (2 or more). Bloom, Bautch, Duronio, Searles, Stafford.

932 [314] RESEARCH IN PLANT MOLECULAR BIOLOGY (2 or more). Fall and spring. Copenhaver, Dangl, A. Jones, Kieber, Liljegren, Reed.

941 [300] RESEARCH IN CYTOLOGY AND CELL BIOLOGY (2 or more). Bollenbacher, Conlon, Gilbert, Goldstein, Harris, Liljegren, Salmon.

942 [304] RESEARCH IN EMBRYOLOGY (2 or more). Bautch, Harris, Peifer.

943 [309] RESEARCH IN PHYSIOLOGY: CELLULAR, COMPARATIVE, NEUROPHYSIOLOGY (2 or more). Kier, Lohmann, Salmon.

951 [302] RESEARCH IN NEUROBIOLOGY (NBIO 951, PHCO 951, PHYI 951) (2 or more). Lohmann, Wiley, and faculty of the Neurobiology Curriculum.

952 [303] RESEARCH IN ETHOLOGY AND ANIMAL BEHAVIOR (2 or more). Kier, Lohmann, Wiley.

953 [306] RESEARCH IN MARINE SCIENCES (MASC 940) (2 or more). Kier, Lohmann, Peterson.

954 [307] RESEARCH IN MARINE SCIENCES ON MOLLUSCA, CRUSTACEA, ICHTHYOLOGY OR OCEANOGRAPHY (at the Institute for Marine Sciences, Morehead City, N.C.) (2 or more). Approval by the Department of Biology required. Chestnut, Fahy, Peterson, Schwartz.

955 [310] RESEARCH IN VERTEBRATE OR INVERTEBRATE ZOOLOGY (2 or more). Kier, Lohmann.

957 [316] RESEARCH IN PLANT SYSTEMATICS (2 or more). Fall and spring. Staff.

958 [317] RESEARCH IN PLANT MORPHOLOGY AND ANATOMY (2 or more). Fall and spring. Gensel.

959 [318] RESEARCH IN PALEOBOTANY (2 or more). Fall and spring. Gensel.

961 [301] RESEARCH IN ECOLOGY (2 or more). Kingsolver, Peet, Peterson, Reice, Stiven, White, Wiley.

Special Graduate Registration

993 [393] MASTER'S THESIS IN BIOLOGY (3 or more). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION IN BIOLOGY (3 or more). Fall and spring. Staff.

Department of Biomedical Engineering

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H. TROY NAGLE, *Founding Chair (38) Medical Devices, Microsensors*

Faculty at the University of North Carolina at Chapel Hill

Professors

*Albert J. Banes (49) Cytomechanics
*Henry S. Hsiao (3) Medical Instrumentation
*Stephen Knisley (1) Biomedical Systems, Medical Devices, Medical Instrumentation, Mathematical Modeling, Cardiac Electrophysiology
Weili Lin, Medical Imaging
Terry Magnuson, Genomics, Genetics
Harold Pillsbury, Neurobiology, Cochlear Implants
Etta Pisano, Medical Imaging, Breast Cancer Research
J. Michael Ramsey, Medical Instrumentation
Barry Whitsel, Neurobiology

Adjunct Professors

Edward Chaney, Biomedical Imaging
Greg Forest, Transport Processes in the Lung, Flow and Structure of Nanomaterials and Macromolecular Fluids
Henry Fuchs, Virtual Reality
Anthony Hickey, Pharmacy
Timothy A. Johnson, Cardiac Electrophysiology
Keith Kocis, Quantifying Diaphragm Function in Children Using Ultrasonography; Femoral Artery Injury in Children; Clinical Drug Trials in Critically Ill Children.
Stephen M. Pizer, Medical Image Processing, Three-Dimensional Display Techniques
Lola M. Reid, Functional Tissue Engineering
Richard Superfine, Condensed Matter Physics, Biophysics and Microscopy
Alexander Tropsha, Computer Assisted Drug Delivery
Bradley Vaughn, Sleep Monitoring
Sean Washburn, Medical Instrumentation

Research Associate Professor

Jan Wooten

Associate Professors

*Robert Dennis (21) Tissue Mechanics, Biomechanics, Functional Tissue Engineering
*Jeffrey Macdonald (30) Metabolomics
*Roger Narayan (17) Biomedical Sensors, Medical Devices, Biomaterials, Nanometer Systems
*Mark Tommerdahl (48) Neurobiology, Image Processing and Analysis, Physiological Systems

Adjunct Associate Professors

Thomas O'Connell
Anna Spagnoli
Jeffery Y. Thompson, Biomaterials
Bing Yu, Biomechanics, Rehabilitation, Movement Analysis

Research Associate Professors

*Oleg Favorov (31) Digital Signal Processing/Multidimensional Signal Processing, Biomedical Systems, Neural Networks, Bioinformatics, Neurobiology
*Stephen R. Quint (29) Digital Signal Processing/Multidimensional Signal Processing, Biomedical Systems, Computer Applications/Software Engineering

Adjunct Research Associate Professors

*Charles C. Finley (44) Digital Signal Processing/Multidimensional Signal Processing, Medical Devices, Medical Instrumentation, Cochlear Implants
Paul Weinhold (39) Orthopaedics, Biomechanics and Biomaterials

Assistant Professors

Andrei Aleksandrov
*Gallippi, Caterina (16) Biomedical Imaging, Medical Imaging, Image Processing and Analysis
Morgan Giddings , Bioinformatics
*Sean Gomez (12) Bioinformatics, Mathematical Modeling, Genomics, Systems Biology

Adjunct Assistant Professors

Timothy Crowder, Drug Inhalation
Ekhson Holmuhamedov
Darin Padua, Sports Medicine

Research Assistant Professor

*Richard Goldberg (5) Medical Instrumentation

Professors Emeriti

N. A. Coulter Jr.
Richard N. Johnson
Carol L. Lucas
Lloyd R. Yonce

Faculty at North Carolina State University

Core Faculty

Lianne Cartee, Mathematical Modeling, Bioelectric Stimulation
Paul Dayton (19) Medical Devices, Medical Instrumentation, Biomedical Imaging, Medical Imaging
Michael Gamcsik, Biomedical Imaging, Functional Tissue Engineering, Metabolomics, Pharmacy
Edward Grant, Robotics, Biomedical Systems, Neural Networks, Biomedical Sensors, Medical Devices
David Lalush, Image Analysis, Biomedical Imaging, Medical Imaging, Bioinformatics, Image Processing and Analysis
Elizabeth Loboa, Tissue Mechanics, Cytomechanics, Modeling in Mechanobiology, Musculoskeletal Biomechanics, Biomechanics
Greg McCarty, Nanometer Systems, BioMEMS, Bioelectric Stimulation, Biochemical Engineering
Marian McCord, Medical Textiles
Peter Mente, Tissue Mechanics, Cytomechanics, Modeling in Mechanobiology, Musculoskeletal Biomechanics, Biomechanics
Hatice O. Ozturk, Digital Signal Processing/Multidimensional Signal Processing, Biomedical Image Processing and Analysis
Brooke N. Steele, Medical Imaging, Biomechanics, Physiology Systems, Mathematical Modeling, Biofluids Modeling, Simulation Based Medical Planning
Glenn Walker, BioMEMS

Associate Faculty

Nina Allen, Microscopy
Donald L. Bitzer, Bioinformatics
Mohamed Bourham, Biomedical Imaging, Medical Imaging, Fluid Dynamics, Mathematical Modeling
James J. Brickley Jr.
Gregory D. Buckner, Robotics
John Cavanaugh, Biomedical Sensors
Mo-Yuen Chow, Intelligent Systems, Bioengineering
Laura I. Clarke, Nanoscale Science and the Study of Molecular Rotors, Torsional Molecular Dynamics and Artifical Molecular Dielectrics
Stuart L. Cooper, Biomaterials
Denis Cormier, Medical Devices, Medical Instrumentation, Biomaterials, Implant Design
Paul Dayton, Medical Devices, Medical Instrumentation, Biomedical Imaging,

Medical Imaging
Dan Feldheim, Nanometer Systems
Michael Gamcsik, Biomedical Imaging, Functional Tissue Engineering, Metabolomics, Pharmacy
Robin P. Gardner, Biomedical Imaging
Russell E. Gorga, Biomaterials, Functional Tissue Engineering, Medical Textiles, Microscopy
Robert Grossfeld, Neurobiology, Physiological Systems
Mansoor A. Haider, Tissue Mechanics, Biomechanics, Mathematical Modeling
S. Andrew Hale, Medical Instrumentation
Ola L. A. Harrysson, Biomedical Imaging, Biomaterials, Functional Tissue Engineering
William C. Holton, Device Simulation and Modeling, Microelectronics, Biomedical Systems, Biomedical Sensors, Medical Devices, Biomedical Imaging
Clement Kleinstreuer, Medical Instrumentation, Biomechanics, Nanometer Systems, BioMEMS, Fluid Dynamics, Physiological Systems, Mathematical Modeling
Hamid Krim, Digital Systems and Signal Processing, Medical Imaging
Andrey Kuznetsov, Medical Devices, Tissue Mechanics, Biomaterials, Biomechanics, Fluid Dynamics, Biofluids Modeling, Biochemical Engineering
Gianluca Lazzi, Computer-Aided Design, Modeling, Electromagnetic Fields, Antenna Analysis, Microwave Devices and Circuits
Sharon R. Lubkin, Tissue Mechanics, Cytomechanics, Modeling in Mechanobiology, Biomaterials, Biomechanics, Image Processing and Analysis
Nancy A. Monteiro-Riviere, Functional Tissue Engineering
John F. Muth, Optical Materials and Devices
Bruce Oberhardt, Medical Devices
Mette S. Olufsen, Biomedical Systems, Large-Scale Nonlinear Systems, Distribution Systems, Biomechanics
Behnam Pourdeyhimi, Medical Textiles
Jie Qi, Tissue Mechanics
Afsaneh Rabiei, Biomechanics
M.K. Ramasubramanian, Biomechanics
Simon C. Roe, Tissue Mechanics, Musculoskeletal Biomechanics, Biomaterials, Biomechanics
Stefan Seelecke, Biomechanics, Fluid Dynamics
Charles E. Smith, Neurobiology, Physiological Systems, Mathematical Modeling, Bioelectrical Stimulation
Wesley E. Snyder, Digital Signal Processing, Multidimensional Signal Processing, Adaptive Signal Processing, Image Analysis, Computer Vision, Robotics
Larry F. Stikeleather, Biomechanics
Anne Stomp, Genomics
Michael K. Stoskopf, Veterinary Medicine
Donald E. Thrall, Veterinary Medicine
Alan E. Tonelli, Biomedical Systems, Biomedical Sensors, Medical Devices, Nanometer Systems, Functional Tissue Engineering
Anka N. Veleva, Biomaterials, Biochemical Engineering
Mladen A. Vouk, Digital Signal Processing, Multidimensional Signal Processing, Reliability Computer Applications, Software Engineering, Large Programs
Donald J. Woodward

Professors Emeriti

C. Frank Abrams, Tissue Mechanics, Biomechanics

** basic teaching faculty*

Biomedical engineering is a dynamic field stressing the application of engineering techniques and mathematical analysis to biomedical problems. Faculty research programs are key to the program, and they include digital systems and signal processing, instrumentation, telemedicine, microelectronics, medical imaging, biofluids and biomechanics, biomaterials and tissue engineering, biosystems analysis and biomedical informatics. Facilities include a biomedical sensors laboratory, a tissue engineering laboratory, tissue and cell mechanics laboratories and an array of cell culturing and computing resources. The department offers graduate education in biomedical engineering leading to the master of science and doctor of philosophy degrees. Also, a new joint graduate certificate in medical devices is to be offered.

Students enter this program with backgrounds in engineering, physical science, mathematics or biological science. Curricula are tailored to fit the needs and develop the potential of individual students. In addition, courses in statistics, mathematics, life sciences and engineering sciences provide a well-rounded background of knowledge and skills.

The Joint Biomedical Engineering Graduate Program is administered by the combined biomedical engineering graduate faculty from both North Carolina State University and the University of North Carolina at Chapel Hill. The joint program also has close working relations with the Research Triangle Institute and industries in the Research Triangle area. These associations enable students to obtain research training in a wide variety of fields and facilitate the selection and performance of dissertation research. Students in the joint program may study under faculty members based at the University of North Carolina at Chapel Hill or at North Carolina State University. The department, thus, provides students with excellent opportunities to realize the goal of enhancing medical care through the application of modern technology.

Admission Requirements

Students must satisfy all entrance requirements for The Graduate School of the University of North Carolina at Chapel Hill or the Graduate School at North Carolina State University, and must demonstrate interest and capability commensurate with the quality of the biomedical engineering program. Prospective students may apply to the graduate school at either UNC-Chapel Hill or NC State. All applicants are considered together as a group. Generally, applications should be submitted by January 15 for consideration for admission in the coming fall semester. Applicants are expected to present Graduate Record Examination (GRE) scores; scores for verbal and quantitative should be at or above the 50th percentile to be competitive. The program requires that a one-to-three page personal statement about research interest and background be submitted.

Students should have a good working knowledge of mathematics at least through differential equations, plus two years of physical or engineering science and basic courses in biological science. Deficiencies in preparation can be made up in the first year of graduate training.

Requirements for Degrees

Candidates for the UNC-Chapel Hill/NC State jointly issued degrees in biomedical engineering must have met the general requirements of The Graduate School of the University of North Carolina at Chapel Hill or the North Carolina State University Graduate School. Master's students are required to take a comprehensive examination, encompassing coursework and thesis research. The master's comprehensive exam may be either written or oral, and is administered by the students advisory committee. Doctoral students qualify for the Ph.D. degree by meeting grade requirements in their core courses, and then advance on to written and oral preliminary exams before admission to candidacy. Details can be found on the department Web site at www.bme.ncsu.edu/academics/graduate/Exams.html. Degree candidates in this program are expected to obtain experience working in a research laboratory during their residence and to demonstrate proficiency in both teaching

and research. The Ph.D. dissertation should be judged by the graduate committee to be of publishable quality.

UNC-Chapel Hill Biomedical Engineering Courses

Courses for Graduates and Advanced Undergraduates

** core curriculum courses*

***400 [100] INTRODUCTION TO BIOMEDICAL ENGINEERING** (1). Seminar introducing students to biomedical engineering research, including literature search, faculty presentation of ongoing research and student discussion of research papers. Fall. Staff.

***430 [121] DIGITAL SIGNAL PROCESSING I** (APPL 430) (3). Prerequisite, COMP 110 or 116 or equivalent. This is an introduction to methods of automatic computation of specific relevance to biomedical problems. Sampling theory, analog-to-digital conversion, digital filtering will be explored in depth. Spring. Lucas.

***450 [132] LINEAR CONTROL THEORY** (APPL 450) (4). Prerequisite, MATH 528 or equivalent. Linear control system analysis and design are presented. Frequency and time domain characteristics and stability are studied. These techniques are applied in an included laboratory. Fall. Quint.

460 [110] SURVEY OF ENGINEERING MATH APPLICATIONS (APPL 460) (1). Computational laboratory that surveys engineering math with emphasis on differential equations, and Laplace and Fourier analysis. Applications in biomedical engineering emphasized through problem set computation using Matlab. This course should be taken concurrently with MATH 528. Fall. Finley.

***465 [111] BIOMEDICAL INSTRUMENTATION I** (APPL 465) (4). Prerequisite, PHYS 351. Topics include basic electronic circuit design, analysis of medical instrumentation circuits, physiologic transducers (pressure, flow, bioelectric, temperate, and displacement). This course includes a laboratory where the student builds biomedical devices. Spring. Hsiao.

505 [102] BIOMECHANICS (3). Prerequisites, MATH 383, PHYS 116 and permission of instructor. Fundamental principles of solid and fluid mechanics applied to biological systems. Human gait analysis, joint replacement, testing techniques for biological structures and viscoelastic models are presented. Papers from current biomechanics literature will be discussed.

510 [112] BIOMATERIALS (APPL 510) (3). Prerequisite, BMME 589 or one year of college-level biology. Chemical, physical engineering and biocompatibility aspects of materials, devices or systems for implantation in or interfering with the body cells or tissues. Food and Drug Administration and legal aspects. Fall. Banes/Narayan.

515 [153] BIOMATHEMATICAL MODELING (3). Prerequisite, engineering-level mathematics, e.g., MATH 383, 528. Various approaches to mathematical modeling of biological systems will be considered. The major focus at the cellular level will be expanded to include examples in organs, organisms and populations.

520 [160] FUNDAMENTALS OF MATERIALS ENGINEERING (3). The structure, defects, thermodynamics, kinetics and properties (mechanical, electrical, thermal and magnetic) of matter (metals, ceramics, polymers and composites) will be considered. Spring. Staff.

532 [154] MICROELECTRODE TECHNIQUES (4). Prerequisites, BIOL 101 and PHYS 351 or equivalent. Models for measurement of cellular transmembrane voltages with microelectrodes are introduced. Basic and technical aspects of the measurements are described. Students fabricate microelectrodes and measure action potentials in living cells.

550 [141] MEDICAL IMAGING: ULTRASONIC, OPTICAL AND MAGNETIC RESONANCE SYSTEMS (3). Prerequisites, BIOS 550, BMME 430 and PHYS 128. Physical and mathematical foundations of ultrasonic, optical and magnetic resonance imaging systems in application to medical diagnostics. Each imaging modality is examined on a case-by-case basis, highlighting the following critical system characteristics: 1) underlying physics of the imaging system, including the physical mechanisms of data generation and acquisition; 2) image creation and 3) basic processing methods of high relevance, such as noise reduction. Fall. (Alternate years.) Gallippi.

560 [142] MEDICAL IMAGING: X-RAY, CT AND NUCLEAR MEDICINE SYSTEMS (3). Prerequisites, APPL 410, BIOS 550 and PHYS 128. Overview of medical imaging systems using ionizing radiation. Interaction of radiation with matter. Radiation production and detection. Radiography systems and applications. Tomography. PET and SPECT systems and applications. Fall. (Alternate years.) Lalush.

***570 [151] FROM GENES TO TISSUES: MOLECULAR BIOLOGY AND GENETICS FOR BIOMEDICAL ENGINEERS** (4). Prerequisites, undergraduate organic chemistry or biochemistry and undergraduate biology, or permission of the instructor. An introduction to molecular, cell and tissue biology for BMME students covering molecular genetics, gene expression, self-assembling mechanisms, metabolism, bioenergetics, cell organelles, regulation of growth and differentiation and signaling. Fall. Macdonald, Bernacki.

580 [120] MICROCONTROLLER APPLICATIONS I (3). Introduction to digital computers for online, real-time processing and control of signals and systems. Programming analog and digital input and output devices using C and assembly language is stressed. Case studies are used as vehicles to present software design strategies for real-time laboratory systems.

581 [220] MICROCONTROLLER APPLICATIONS II (3). Prerequisites, BMME 465 and 580. Problems of interfacing computers with biomedical and systems are studied. Students collaborate to develop a new biomedical instrument. Projects have included process control, data acquisition, disk systems interfaces and DMW interfaces between interconnected computers.

***589 [181] SYSTEMS PHYSIOLOGY FOR BIOMEDICAL ENGINEERS** (5). Prerequisites, six hours of undergraduate biology or chemistry and permission of the instructor. A graduate-level introduction to systems and organ physiology. Topics covered will include membrane structure and physiology, muscle physiology, central neural systems, cardiac electrophysiology and endocrinology. Fall. Tommerdahl.

Courses for Graduate Students

705 [260] BIOMATERIALS INSTRUMENTATION (3). Prerequisite, BMME 520 or permission of the instructor. Within a laboratory environment, the fundamental or engineering properties of various biomaterials are evaluated. Scientific methodology, data analysis and technical report writing are stressed. Spring.

730 [223] DIGITAL SIGNAL PROCESSING II (3). Prerequisites, BMME 430, MATH 528 and BMME 450 or equivalent. Advanced techniques for analyzing biomedical systems and signals are presented, including signal characterization, pattern recognition and parameter estimation. Examples from biomedical literature are studied. Spring. Favorov.

740 [212] ADVANCED BIOMATERIALS (MTSC 740) (3). Prerequisite, BMME 510 or permission of the instructor. Medical or dental implants or explants are highlighted from textbooks, scientific literature and personal accounts. Spring. Banes, Narayan.

750 [232] DIGITAL CONTROL THEORY (3). Prerequisite, BMME 450 or equivalent. Discrete time systems performance and stability are represented in the time and frequency domains. Series compensation and state variable design techniques are studied. Student projects include discrete time control designs, simulations and implementation using laboratory devices. Spring. Quint.

760 [235] FINITE ELEMENT ANALYSIS (3). Prerequisites, BMME 405 or equivalent and permission of the instructor. The underlying principles associated with the finite element method are presented along with applications. Topics to be included are the development of the stiffness matrix, node numbering schemes, potential energy and the Rayleigh-Ritz method, and element selection. Fall (odd-numbered years). Weinhold.

765 [201] BIOMEDICAL INSTRUMENTATION II (3). Prerequisite, BMME 465 or permission of the instructor. The fundamentals of interfacing

microprocessors and microcomputers with physiological transducers. Practical circuit design problems are presented with biomedical applications. This course includes a laboratory and individual student projects. Fall. Hsiao.

770 [251] PHYSIOLOGY AND METHODS IN GENOMICS (5). Prerequisites, BMME 570 or undergraduate organic chemistry or biochemistry and undergraduate biology or with permission of instructor. Lectures in physiology systems and lab techniques covering various functional genomic methods including DNA sequencing, gene arrays, proteomics, confocal microscopy and imaging modalities. Spring. Macdonald, Bernacki.

775 [259] IMAGE PROCESSING AND ANALYSIS (COMP 775) (3). Prerequisites, COMP 665, MATH 547 and STAT 435. Approaches to analysis of digital images. Scale geometry, statistical pattern recognition, optimization. Segmentation, registration, shape analysis. Applications, software tools.

780 [220] REAL-TIME COMPUTER APPLICATIONS II (3). Prerequisites, BMME 480, 465. Problems of interfacing computers with biomedical and systems are studied. Students collaborate to develop a new biomedical instrument. Projects have included process control, data acquisition, disk systems interfaces, and DMW interfaces between interconnected computers. Spring. Goldberg.

***790 [281] SYSTEMS PHYSIOLOGY FOR BIOMEDICAL ENGINEERS II** (3). Prerequisite, BMME 589. This is the second semester of the two-semester series intended to provide graduate students with an introduction to systems and organ physiology. Spring. Tommerdahl.

795 [282] INFORMATION PROCESSING IN THE CENTRAL NERVOUS SYSTEM (3). Prerequisite, BMME 589. Introduction to methodologies used to characterize a) the aggregate behavior of living neural networks and b) the changes in that behavior that occurs as a function of stimulus properties, pharmacological manipulations and other factors that dynamically modify the functional status of the network. Spring. (Alternate years.) Tommerdahl.

810 [252] DIGITAL NUCLEAR IMAGING (3). Prerequisites, BMME 550, 560. Advanced topics of physics and instrumentation in nuclear imaging and magnetic resonance techniques. Fall. (Alternate years.)

820 [253] ADVANCED MEDICAL IMAGE PROCESSING (3). Prerequisites, BMME 550, 560. Theory and digital implementation of image processing and reconstruction techniques applied in medical imaging are discussed. Specific topics include filtering, edge detection and image reconstruction algorithms. Spring. (Alternate years.)

840 [290] REHABILITATION ENGINEERING DESIGN (4). Prerequisites, BMME 465 or permission of the instructor. Students will design an assistive technology device to help individuals with disabilities to become more independent. The project will be used in the community when it is completed. Spring. Goldberg.

860 [230] NUMERICAL METHODS FOR BIOMEDICAL ENGINEERING (3). Prerequisite, MATH 383, BMME 480, or experience in Car Fortran programming. Emphasis on numerical methods for solving inverse problems relevant to biomedical engineering, Matrix inversion, singular value decomposition and parameter estimation are covered with an emphasis on application of the methods. Fall. (Alternate years.) Favorov.

890 [231] SPECIAL TOPICS (Hours to be arranged.) Prerequisite, permission of the instructor. Special library and/or laboratory work on an individual basis on specific problems in biomedical engineering and biomedical mathematics. Direction of students is on a tutorial basis and subject matter is selected on the basis of individual needs and interests. Fall and spring. Staff.

900 [311] RESEARCH IN BIOMEDICAL ENGINEERING AND BIOMATHEMATICS (Hours to be arranged.) Prerequisite, permission of the instructor. Staff.

910L [300] LABORATORY ROTATION IN BIOMEDICAL ENGINEERING (1). Laboratory practicum in a University of North Carolina at Chapel Hill lab. Observational and hands-on experience in state-of-the-art biomedical laboratories with bioengineering faculty/preceptor. Fall and spring. Hsiao.

920L [301] LABORATORY ROTATION IN FUNCTIONAL GENOMICS (1). Prerequisites, BMME 570 and permission of the instructor. Students are required to work in two laboratories that involve 1) the creation and analysis of mouse technologies and 2) developing technologies (biosensors or imaging) for use in functional genomics. Spring. Macdonald.

993 [393] MASTER'S THESIS (Hours to be arranged.) Staff.

994 [394] DOCTORAL DISSERTATION (Hours to be arranged.) Staff.

North Carolina State University Biomedical Engineering Courses

512 BIOMEDICAL SIGNAL PROCESSING (3) Prerequisites, BME 311, and ST 370 or ST 371; BME or graduate standing only. (Credit is not allowed for both BME 412 and BME 512.) Fundamentals of continuous- and discrete-time signal processing as applied to problems in biomedical instrumentation. Properties of biomedical signals and instruments. Descriptions of random noise and signal processes. Interactions between random biomedical signals and systems. Wiener filtering. Sampling theory. Discrete-time signal analysis. Applications of Z-transform and discrete Fourier transform. Digital filter design methods for biomedical instruments. Spring. Lalush.

522 MEDICAL INSTRUMENTATION (3). Students should have a background in electronics design using operational amplifiers Fundamentals of medical instrumentation systems, sensors, and biomedical signal processing. Example instruments for cardiovascular and respiratory assessment. Clinical laboratory measurements, therapeutic and prosthetic devices, and electrical safety requirements.

525 BIOELECTRICITY (3). Prerequisites, BME 302 or ZO 421 and a course in electrical circuits; senior or graduate standing. (Credit is not given for both BME 425 and BME 525.) Quantitative analysis of excitable membranes and their signals, including plasma membrane characteristics, origin of electrical membrane potentials, action potentials, voltage clamp experiments, the Hodgkin-Huxley equations, propagation, subthreshold stimuli, extracellular fields, membrane biophysics and electrophysiology of the heart. Design and development of an electrocardiogram analysis system. Fall. Cartee.

541 BIOMECHANICS (3). Prerequisites, ZO 160 or BIO 183, BME 342, ST 370. (Credit is not allowed for both BME 441 and BME 541.) Students study human body kinematics, force analysis of joints, and the structure and composition of biological materials. Emphasis is placed on the measurement of mechanical properties and the development and understanding of models of biological material. Fall. Mente.

543 CARDIOVASCULAR BIOMECHANICS (3). Prerequisites, BME 302, MAE 308 or CE 382. Engineering principles are applied to the cardiovascular system. Anatomy of cardiovascular system; form and function of blood and blood vessels. Electric analogs; continuum mechanics with derivation of equations of motion; and constitutive models of soft tissue mechanics, with attention to normal, diseased and adaptive processes. Programming project required. Fall. Steele.

550 MEDICAL IMAGING: ULTRASONIC, OPTICAL, AND MAGNETIC RESONANCE SYSTEMS (3). Prerequisites, BME 412, ST 370 or ST 371, and PY 208. Physical and mathematical foundations of ultrasonic, optical and magnetic resonance imaging systems in application to medical diagnostics. Each imaging modality is examined on a case-by-case basis, highlighting the following critical system characteristics: 1) underlying physics of the imaging system, including the physical mechanisms of data generation and acquisition 2) image creation and 3) basic processing methods of high relevance, such as noise reduction. Alternate Fall. Gallippi.

551 MEDICAL DEVICE DESIGN I (3). Prerequisite, graduate standing. Student multidisciplinary teams work with local medical professionals to define specific medical device concepts for implementation. Medical specialty immersion with clinical departments at local medical centers; design input based on stakeholder-needs assessment, market analysis and intellectual property review,

new medical devices with broad markets, design output and device specification, product feasibility and risk assessment, design for medical device manufacturing. Fall. Nagle.

552 MEDICAL DEVICE DESIGN II (3). Prerequisite,: BME 551. Student groups build and test prototypes of devices designed in the first course of this series. Good manufacturing practices, process validation, FDA quality system regulations, design verification and validation, regulatory approval planning and intellectual property protection. Students will work with local patent attorneys and/or agents to draft a patent application. The final prototypes will be evaluated by clinicians for potential use with patients. Spring. Nagle.

560 MEDICAL IMAGING: X-RAY, CT AND NUCLEAR MEDICINE SYSTEMS (3). Prerequisites: BME 311, ST 370 or ST 371, and PY 208. Overview of medical imaging systems using ionizing radiation. Interaction of radiation with matter. Radiation production and detection. Radiography systems and applications. Tomography. PET and SPECT systems and applications. Alternate Fall. Lalush.

590 SPECIAL TOPICS (1–4). Prerequisite, senior or graduate standing in engineering or physical or biological sciences. A study of topics in the special fields under the direction of the graduate faculty. Fall, spring and summer. Staff.

590R LABORATORY ROTATION IN BIOMEDICAL ENGINEERING (1). Laboratory practicum in a North Carolina State University lab. Observational and hands-on experience in state-of-the-art biomedical laboratories with bioengineering faculty/preceptor. Fall and spring. Knisley.

601 BIOMEDICAL ENGINEERING SEMINAR (1). Prerequisite, graduate standing. Elaboration of subject areas, techniques and methods important in biomedical engineering through presentations of personal and published works; opportunity to present and critically defend ideas, concepts and inferences. Discussions to identify analytical solutions and analogies between problems in biomedical engineering and other technologies, and to present relationship of biomedical engineering to societal needs. Fall and spring.

620 BIOMEDICAL ENGINEERING: SPECIAL PROBLEMS (1–4). Prerequisite, graduate standing in biomedical engineering. Selection of a subject by each student on which to do research and write a technical report on the results. Subject may pertain to the student's particular interest in any area of study in biomedical engineering. Fall, spring and summer.

650 INTERNSHIP IN BIOMEDICAL ENGINEERING (1–3). Prerequisite, graduate standing in biomedical engineering. Students obtain professional experience through advanced engineering work in industrial and commercial settings under joint supervision of a member of the graduate faculty and an outside professional. Fall, spring and summer.

790 ADVANCED SPECIAL TOPICS (1–4). Prerequisite, graduate standing in engineering, physical or biological sciences. A study of topics in advanced or emerging special areas under the direction of the graduate faculty. Experimental doctoral level courses. Fall, spring and summer.

802 BIOMEDICAL ENGINEERING ADVANCED SEMINAR (1). Elaboration of advanced subject areas, techniques and methods related to professional interest through presentations of personal and published works; opportunity for students to present and critically defend ideas, concepts and inferences; opportunity for distinguished scholars to present results of their work. Discussions to uncover analytical solutions and analogies between problems in biomedical engineering and other technologies, and to present relationship of biomedical engineering to society. Fall and spring.

Kenan-Flagler Business School

www.kenan-flagler.unc.edu
JAMES W. DEAN JR., *Dean*

Professors

Robert Sanford Adler (3) Legal Studies, Business Ethics, Government Regulations
Carl Robert Anderson (80) Strategic Management, Organizational Design, Organizational Decision Making
Gary M. Armstrong (2) Public Policy in Marketing, Sales Force Management
Barry L. Bayus (131) Marketing Research, Technology Changes, Product Management
Richard A. Bettis, Strategic Management, Global Competition, Technological Innovation, Strategic Change
Edward Joseph Blocher (61) Auditing, Management Accounting
Paul N. Bloom (95) Public Policy, Nonprofit Marketing, Marketing Professional Services
Robert M. Bushman, Information Economics, Corporate Governance, Executive Compensation, Organizational Structure
Daniel Cable (154) Human Resources Management Selection, Recruitment, Compensation
Jennifer S. Conrad (107) Market Constraints, Stocks and Options
James W. Dean (158) Quality Management, Strategic Decision Making, Organizational Cynicism
Jeffrey R. Edwards (160) Person-Organization Fit, Work-Family Issues
Douglas Allen Elvers (18) Production/Operations Management, Scheduling, Project Management
John Parkhill Evans (20) Operations Research, Mathematical Programming
Paolo Fulghieri, Finance
John R. M. Hand (126) Financial Accounting, Capital Markets, Market Efficiency
David James Hartzell (16) Mortgage Bank Securities, Real Estate Investment, Finance
James H. Johnson, Diversity, Entrepreneurship–Minority, Ethnic Conflict, Management, Small Business–Minority, Urban Economics, Venture Financing, Welfare Reform
Walter Steven Jones, Business Education
John Dale Kasarda (32) Business Globalization, Privatization, Job Creation
Wayne R. Landsman (58) Financial Reporting, Capital Markets
Mark H. Lang (142) International Accounting and Finance, Corporate Disclosure Policy, Earnings, Stock Price Issues
Richard Allan Mann (37) Legal Studies, Regulation of Business, Business Ethics
Ann E. Marucheck (21) Production/Operations, Technology & Innovation Management, Distributions Systems Design and Management, Engineering Management
Edward Maydew, Accounting, Taxation, Corporate Tax Planning, Mergers and Acquisitions–Tax Aspects, Economic Effects of Tax Changes
Alan William Neebe (41) Resource Allocation, Integer Programming, Facility Location, Computer Reliability
Hugh M. O'Neill (131) Corporate Strategy, New Ventures, Turnaround Situations
Ellen Rust Peirce (4) Legal Studies, Labor Law, Government Regulations
William Daniel Perreault Jr. (62) Industrial Marketing, Marketing Research Methods, Marketing Strategy
William P. Putsis, Marketing
David J. Ravenscraft (10) Mergers, Takeovers, Sell-Offs
Richard James Rendleman Jr. (89) Investments, Corporate Finance, Capital Markets Efficiency
Barry Stuart Roberts (63) Legal Studies, Business Ethics, Government Regulation
Benson Rosen (46) Organizational Behavior, Human Resources Management
David Stephen Rubin (47) Operations Research, Integer Programming, Combinatorial Optimization
Albert H. Segars (152) Telecommunications Management, Impact of Technology, Corporate-Level Planning for Information Technology
Douglas A. Shackelford (101) Taxes, Business Strategy, Performance Measurement Systems
Anil Shivdasani (35) Corporate Boards of Directors, Corporate Finance, Corporate Governance, Finance, International Business–Finance, Mergers and Acquisitions, Organizations

Michael A. Stegman, Asset-Building in Low-Income Communities, Community Development Finance, Electronic Benefits Transfer, Housing Policy, Real Estate Finance
Jayashankar M. Swaminathan, Operations, Technology and Innovation Management
Harvey M. Wagner (64) Management, Modeling
D. Clay Whybark (67) Operations Management, International Operations Manufacturing Strategy, Business Logistics
Valarie Zeithaml (169) Service Quality, Services Marketing

Associate Professors

Jeffery Abarbanell, Financial Statement Analysis, Analyst Forecasting, Valuation, Accounting in Transition-to-Market Economies
Sridhar Balasubramanian, Marketing
Richard Stanley Blackburn (81) Organizational Behavior, Organizational Research Methods, Philosophy of Organizational Science
Gregory W. Brown (7) Asset Pricing, Capital Markets, Derivative Securities, Investments, Mutual Funds, Risk Management, Corporate Hedging
Joseph Henry Bylinski (83) Financial Accounting, Auditing
Robert A. Connolly (127) Foreign Currency Markets, Empirical Investments, Capital Markets
Nicholas Michael Didow (15) Consumer Behavior, Marketing Research Methods, Evaluation Research
Wendell Gilland (162) Production Planning and Control, Capacity Management, Business Process Reengineering
Mustafa N. Gültekin (106) Portfolio Theory, Asset Pricing Models, Corporate Finance
David A. Hofmann, Management
J. Morgan Jones (19) Quantitative Consumer Models, Bayesian Decision Theory
Charlotte H. Mason (108) New Product Evaluation, Diffusion of Innovation, Marketing Research Methodologies
Rebecca K. Ratner, Consumer Behavior, Decision Making, Individual Decision Making, Marketing
Jeffrey Reuer, Organizational Behavior and Strategy

Assistant Professors

Peter J. Brews, Management
Qiang Dai, Finance
Alison Fragale, Organizational Behavior and Strategy
Eitan Goldman, Corporate Finance, Microeconomic Theory
Steve E. Hoeffler, Marketing, Consumer Behavior, Decision Making, Sales Forecasting, Information Technology, Electronic Commerce, Internet Marketing
Eda Kemahlioglu-Ziya, Operations Arvind Malhotra, Electronic Commerce, Knowledge Management, Interorganizational Information Technology, Supply Chain Management, Internet Business Opportunities, Internet Startups, Strategic Use of Information Technology, Virtual Teams and Communities
Kahl Matthias, Finance
Ali Parlakturk, Operations
Jana Smith Raedy (166) Market Efficiency/Market Anomalies, Financial Analyst Forecasts
Adam V. Reed, Finance
Sergey Sanzhar, Finance
Merih Sevilir, Finance
Gunter Strobl, Finance
Brian Tomlin, Finance
Gal Zauberman, Marketing

Research Assistant Professor

Stephen Appold, Kenan Institute of Private Enterprise

Adjunct Professors

Susan Aaronson, Kenan Institute of Private Enterprise
Warren E. Baunach (143) Executive Education, Marketing, Competitive Strategy
Gerald D. Bell, Leadership, Management, Negotiation, Teamwork
Bruce Boehm, Management
Linda Carolyn Bowen (9) Financial Accounting, Taxation, Auditing
Jennifer Bremer, Management
Anthony Brown, Entrepreneurial Studies
Edward Cornet, Management
Travis Day, Business Computing Skills
Eric Ghysel, Finance
David Godschalk, Finance
Noel Greis, Air Logistics, Aviation, Innovation, International Manufacturing, International Operations, Logistics, Manufacturing
William H. Grumbles, Organizational Behavior and Strategy
Clay Hamner, Entrepreneurial Studies
Claudia Harris, Organizational Behavior and Strategy
James Harris, Finance
Michael Hussey, Finance
Richard Kouri, CETV
Kevin Leibel, Marketing
Michael Ian Luger, Economic Development, Employment and Welfare Policy, Infrastructure, Public Finance, Urban and Regional Economics
Alexey Malakhov, Finance
Mabel M. Miguel (53) Career Development, Cross-Cultural Management, Diversity, Human Resource Management, International Human Resource Management, Distance Learning, Management
Bill Moore, Investment Banking, Venture Capital, Investment Management, Entrepreneurship
Charles R. Myer, Management
Jack Olin, Management
John J. Pringle, Financial Management
William Reynolds, Finance
Heidi Schultz (167) Business Communication
C. J. Skender, Accounting, Auditing, Decision Making
James Smith, Finance
S. Peter Smith, Manufacturing, Marketing - Strategy, Operations Management, Product Design, Product Development
Judy Jones Tisdale, Consumer Banking Retail Sales, Professional Communication, Sales Coaching and Development
Ronald Williams, Management
Min Wei, Finance

Adjunct Associate Professors

Robert Fairlie, Entrepreneurial Studies
David Neal, Organizational Behavior and Strategy
Atul Nerkar, Finance
Kevin Raedy, Accounting
Donald McIver Stanford Jr., Commercial Law, Legal Environment of Business, Managerial Law, Mutual Funds, Sports Law and Management
Roby B. Sawyers, Accounting
Glenn Voss, Marketing

Adjunct Assistant Professors

Bruce Carlin, Finance
Courtney Edwards, Accounting
Raed Elaydi, Organizational Behavior and Strategy
Eliezer Fich, Finance
Burton Goldstein, Entrepreneurial Studies
Richard Gooner, Marketing
Douglas Guthe, Finance
Lisa Jones Christensen, Entrepreneurship
Corinne Krupp, Finance Trade, Antidumping Trade, Exchange Rates
Claudia Kubowicz Malhotra, Marketing
Susan Palmer, Human Resource Management–Recruitment, Job Design, Management, Organizations–Change, Performance Measurement–Employee, Training and Development

Elliot Silverstein, Management
Kenneth Wiles, Finance
Ted Zoller, Entrepreneurial Studies

Adjunct Lecturers
James Bick, Marketing
John T. Ganzi, Management
Alston Gardner, Entrepreneurial Studies
John Glushik, Entrepreneurial Studies
Lowell Hoffman, Kenan Institute of Private Enterprise
Gregory Hohn, MBA Program
Donald Marple, Management
Merrill Mason, Organizational Behavior and Strategy
Mitch Mumma, Management
Patrick Oglesby, Organizational Behavior and Strategy
Shelby Pohlman, MAC Program
William Powell, Kenan Institute of Private Enterprise
Edward G. Pringle, Consulting, Management, Service Industry
Maria Elena Rodriguez, Kenan Institute of Private Enterprise
Cynthia Setzer, Management
William Shulby, Marketing
Andrew Silton, EMBA Program
Kelley Stephens, MAC Program
Todd J. Weber, Management

Professors Emeriti
Jack N. Behrman
R. Lee Brummet
Dewitt Clinton Dearborn
Robert DesJardins
G. David Hughes
Thomas H. Jerdee
Jay Edward Klompmaker
Clifton Holland Kreps Jr.
Hans E. Krusa
Harold Q. Langenderfer
J. Finley Lee
Richard Levin
Richard Wolcott McEnally
Dannie Joseph Moffie
Isaac Newton Reynolds
Dennis A. Rondinelli
Aleda V. Roth
William S. Stewart
Junius H. Terrell
Rollie Tillman

The Kenan-Flagler Business School offers programs of graduate study leading to the degrees of master of business administration, master of accounting and doctor of philosophy. The school is committed to providing cutting-edge, real-world business education and research. Known for its collegial, intimate environment and selective, diverse admissions, the school prepares tomorrow's leaders in business and industry.
The school pioneered the team approach to learning more than a quarter century ago and has more recently added cross-functional, entrepreneurial and global priorities to its curriculum.

Kenan-Flagler is recognized for world-class teaching. The faculty consistently has been nationally ranked for teaching excellence, availability and responsiveness to students and emphasis on relevant, applied research and case development. Through these efforts, the faculty constantly strives to give students great opportunities for learning.

In fall 1997, the Kenan-Flagler Business School moved to its new state-of-the-art facility located on South Campus. Building features include 18 classrooms with multimedia capabilities, a 456-seat auditorium, and a 250-plus seat multipurpose dining pavilion and activity space.

The world-class McColl Building is a hub of learning, teaching and research. Each classroom, office and study room is designed for maximum use and technological efficiency to support these activities. The building includes an Asynchronous Transfer Mode (ATM) backbone network providing high-speed transmissions within the school and on the Internet, ports in many rooms that allow students to connect laptops from virtually anywhere in the building, a network operating at 100 megabits per second, a computer lab with state-of-the-art multimedia workstations, and network servers that provide students with online access to a number of CDs for company research and historical financial market data.

Master of Business Administration

The Kenan-Flagler Business School's highly ranked master of business administration (M.B.A.) program provides exceptional students the opportunity to develop outstanding functional and analytical skills and the vision of a general manager. The two-year program combines a first year of core courses designed to provide a general management background, technical and analytical expertise, and exposure to decision making in all functional areas of business. The second year provides the opportunity to concentrate in areas of student interest and faculty expertise.

Application forms and a brochure containing detailed information may be obtained by contacting the Kenan-Flagler Business School M.B.A. Admissions Office, CB# 3490, McColl Building, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3490; (919) 962-3236; mba_info@unc.edu, www.kenan-flagler.unc.edu/programs/mba.

Master of Accounting

The Kenan-Flagler Business School's master of accounting (M.A.C.) program's unique approach to accounting and business education involves a challenging curriculum that integrates accounting with other business disciplines and emphasizes the application of accounting concepts to current business issues. The goal of the accounting and business courses is to create well-rounded business advisers who can compete in the international business world. Rather than specializing in specific areas of accounting, M.A.C. students take a broad but balanced series of accounting courses that focus on skill development, problem solving and decision making in business situations. The business core courses are designed specifically for M.A.C. students to emphasize accounting and business consulting skills. The program develops students' communication and leadership skills, giving them a competitive advantage in today's tight job market and enhancing their ability to succeed in the accounting profession.

The M.A.C. program is designed for candidates holding undergraduate degrees in liberal arts, sciences, business and other nonaccounting disciplines. Candidates earn the M.A.C. degree in 12 months of concentrated study. The application deadlines are August 1 (for UNC business majors only), December 1 and March 1. Because admission is competitive and some decisions are made on a rolling basis, applicants are encouraged to apply early.

Application forms and a brochure containing detailed information may be obtained by contacting the Kenan-Flagler Business School M.A.C. Admissions Office, CB# 3490, McColl Building, The Univer-

sity of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3490; (919) 962-3186; mac_info@unc.edu, www.kenan-flagler.unc.edu/programs/mac.

The Executive M.B.A. Program

The Executive M.B.A. (E.M.B.A.) Program provides working professionals the opportunity to acquire the traditional M.B.A. degree without interrupting their careers. Kenan-Flagler offers two attendance options for completing the Executive M.B.A. degree program.

The E.M.B.A. Evening Program classes are held on Monday and Thursday evenings for 24 months. This program is best suited for professionals who live and work in the Triangle area and have careers that do not require frequent weekday travel.

The E.M.B.A. Weekend Program classes are held on alternate weekends (all day Friday and Saturday) for 20 months with two mandatory weeklong residencies for intensive course work. This program is best suited for professionals who travel extensively or who live too far from Chapel Hill to make attending evening classes feasible.

Application forms and a brochure containing detailed information about the program may be obtained by contacting the Executive M.B.A. Program, Kenan-Flagler Business School, The University of North Carolina at Chapel Hill, CB# 3490, McColl Building, Chapel Hill, N.C. 27599-3490; (800) 453-9515; emba@unc.edu, www.kenan-flagler.unc.edu/programs/emba.

Doctor of Philosophy

The Ph.D. program in business administration is designed for individuals who plan careers in research and teaching. A limited number of students are admitted each year, resulting in a high-quality learning environment that emphasizes rigor and personal attention. Although many students enter the program with an M.B.A., this degree is not a requirement for admission. However, an M.B.A. from an accredited institution usually allows the student to waive some of the business fundamentals requirements. Prior to admission to the doctoral program, students are expected to have knowledge of elementary calculus and basic computer skills. A foreign language is not required for graduation from the program. Research and teaching assistantships are available on a competitive basis.

The requirements for the Ph.D. in business administration are

- ***Business Fundamentals.*** All Ph.D. students are expected to possess or to acquire a basic knowledge of accounting, finance, marketing, organizational behavior and production. This requirement involves a level of competence roughly equivalent to the M.B.A. core courses on these topics. Most students entering with an M.B.A. or similar degree meet this requirement without additional course work. Appropriate courses will be recommended for students who do not meet this requirement prior to beginning the program.
- ***Economics.*** All Ph.D. students are expected to possess or to acquire knowledge of microeconomic and macroeconomic theory. The basic requirement is an M.B.A. or graduate-level course on each topic. Once again, most students with an M.B.A. meet this requirement without additional course work. However, individual areas within the Business School (e.g., finance) may require that students take specific courses after entering the program to meet this requirement. Appropriate courses will be recommended for students who do not meet this requirement prior to beginning the program.
- ***Research Methods/Quantitative Methodologies.*** All Ph.D. students are required to take five courses (15 hours) in Research Methods/Quantitative Methodologies. At least one course (three hours) must be a research methods course covering topics such as philosophy of science, research design, sample selection, etc. At least three of the courses (nine hours) must focus on quantitative methodologies such as statistics, operations research, econometrics, etc. The fifth course (three hours) may be a more specialized research methods course (e.g., survey research, lab experimentation) or another quantitative methodologies course.
- ***Major Area of Concentration.*** All Ph.D. students are required to declare a major area. The major area consists of six courses (18 hours). Students may concentrate in one of the following areas:
  - Accounting
  - Operations, Technology and Innovation Management
  - Finance
  - Organizational Behavior
  - Marketing
  - Strategy

These courses may be a combination of required courses offered within the major area, required courses offered outside of the major area or approved elective courses.

- ***Supporting Area.*** All Ph.D. students are required to declare a supporting area. The supporting area consists of four courses (12 hours). The supporting area allows the student to develop a strong expertise in an area related to the student's research and teaching interests. These courses are usually drawn from a single area within the Business School or from a specific outside department, but a student may assemble four courses from more than one area if the courses represent a coherent package.
- ***Research Paper.*** During the summer and fall following the first year, all Ph.D. students are required to complete a research paper. The paper must be evaluated and approved by the student's faculty. The primary purpose of this paper is to provide the student with important research experience and to develop research and writing skills. Most of these papers are later presented at professional meetings and many lead to publication. Some papers develop into dissertations.
- ***Comprehensive Examination.*** All Ph.D. students must pass a written comprehensive examination on the student's major area of concentration and relevant material from the other requirements. Students usually take this examination after completing course work, typically at the end of the second year. Some areas may require an oral examination after completion of the written examination.
- ***Dissertation.*** All Ph.D. students are required to complete a dissertation prior to graduation from the program. The dissertation is a thorough theoretical and empirical investigation of a specific problem important to the student's major area. The dissertation's value is in its contribution to knowledge, in the scholarly manner in which it is organized and presented and in the demonstrated development of the student's conceptual and research skills. Before substantial work on the dissertation is undertaken, a written dissertation proposal must be presented and approved by the student's dissertation committee. In most cases, the dissertation proposal is completed during the student's third year in residence and the dissertation is completed during the fourth year.
- ***Teaching and Research.*** All students are required to serve as teaching assistants for at least one semester and as research assistants for at least one semester. Students are also required to work with faculty prior to that semester on the development of their teaching skills.

Scholarships and Fellowships

Available to doctoral students in business administration are a number of assistantships, each with a value of $16,900 for the academic year. The school provides summer assistantships for doctoral students who receive awards from the University or the school during the academic year. These assistantships carry stipends of $3,100 for the summer. Once a doctoral student is awarded financial aid, the school generally provides support for eight semesters if the student is making satisfactory academic progress.

Courses for Doctoral Candidates

808 [308] APPLIED RESEARCH METHODS I (3). Addresses fundamentals of empirical social science research. Topics include framing a research question, comparing research designs, instrumentation, reliability, validity, and exploratory and confirmatory factor analysis. Emphasizes application and analysis. Edwards.

809 [309] APPLIED RESEARCH METHODS II (3). Continuation of BUSI 808. Topics include statistical control, categorical variables, interaction, curvilinear and similarity effects, longitudinal analysis, path analysis, structural equation modeling and publication. Emphasizes application and analysis. Edwards.

830 [330] THEORY OF OPERATIONS MANAGEMENT I (3). Prerequisite, permission of the instructor. Rigorous study of traditional and modern issues, problems and approaches in operations management. Fall and spring. Staff.

831 [331] THEORY OF OPERATIONS MANAGEMENT II (3). Prerequisite, BUSI 830 or equivalent. A continuation of BUSI 830. Fall and spring. Staff.

832 [332] THEORY OF OPERATIONS MANAGEMENT III (3). Prerequisite, BUSI 830 or equivalent. A continuation of BUSI 330. Fall and spring. Staff.

837 [337] ADVANCED TOPICS IN OPERATIONS MANAGEMENT (3). Prerequisite, permission of the instructor. Intensive study of a specific area in operations management. Spring. Staff.

838 [338] SEMINAR IN OPERATIONS MANAGEMENT (3). Prerequisite, permission of the instructor. Intensive study of a specific area in operations management. Spring. Staff.

851 [351] INDIVIDUAL BEHAVIOR IN ORGANIZATIONS (3). Analysis of individual behavior, adjustment and effectiveness. Examination of attitudes, stress, problem solving, decision making, motivation and personality. Applications to management of human resources. Fall. Hofmann.

852 [352] INTERPERSONAL AND INTERGROUP BEHAVIOR IN BUSINESS ORGANIZATIONS (3). Intensive critical examination of interpersonal and intergroup behavior, including decision processes, communication, conflict and conflict resolution in large organizations. Spring. Staff.

853 [353] MACRO ORGANIZATIONAL BEHAVIOR (3). Prerequisite, graduate standing in business administration. Intensive study of theory and research in organizational structure, coordinating and control mechanisms, design parameters and environments. Spring. Blackburn.

854 [354] ORGANIZATIONAL DESIGN AND DEVELOPMENT (3). The development of understanding and skills in changing and evolving organizational design, interpersonal relationships and people to achieve organizational goals. Spring. Staff.

856 [356] SEMINAR IN ORGANIZATIONAL BEHAVIOR (3). Prerequisite, permission of the instructor. Intensive study of important current theory and research in organizational behavior. Fall. Staff.

857 [357] SEMINAR IN HUMAN RESOURCE MANAGEMENT (3). Review the research literature on how firms are made more effective through their people. Coverage includes topics like recruitment, hiring, compensation, socialization, culture and performance management. Fall. Cable.

860 [360] SEMINAR IN MARKETING I (3). Prerequisite, permission of the instructor. Overview of current paradigms and research in marketing. Topics include philosophy of science, differing views of what marketing is, strengths and weaknesses of various research approaches and career socialization issues. Fall. Lurie.

861 [361] SEMINAR IN MARKETING II (3). Prerequisite, BUSI 860. Intensive study of the empirical and analytical literature involving problems in pricing, product development and management, advertising and promotion, distribution and strategy. Staff.

865 [365] SEMINAR IN CURRENT MARKETING TOPICS (1). Prerequisite, permission of the instructor. Advanced research in marketing. A seminar to discuss current research of doctoral candidates, faculty and invited guests. Fall and spring. Staff.

867 [367] ISSUES IN THE DESIGN AND ANALYSIS OF RESEARCH IN MARKETING (3). Prerequisite, graduate standing in business administration. A review of major issues in marketing, including philosophy of science, measurement and experimental and quasi-experimental design. Fall. Staff.

868 [368] SEMINAR IN MARKETING RESEARCH METHODOLOGY (3). Prerequisite, permission of the instructor. An introduction to multivariate data analysis methods including factor analysis, cluster analysis, logic, discriminant analysis and multidimensional scaling. Spring. Staff.

876 [376] SEMINAR IN RESEARCH IN ACCOUNTING (1). Prerequisite, permission of the instructor. An informal seminar to discuss current research in accounting. Fall and spring. Staff.

880 [380] FINANCIAL ECONOMICS (3). Prerequisite, permission of the instructor. Introduction to the theories of asset pricing. Fall. Staff.

881 [381] CORPORATE FINANCE (3). Prerequisites, BUSI 880 or equivalent and permission of the instructor. Introduction to corporate finance theory. Spring. Goldman.

882 [382] EMPIRICAL CORPORATE FINANCE (3). Prerequisite, permission of the instructor. An introduction to the empirical corporate finance literature. Spring. Kahl.

885 [385] SEMINAR IN RESEARCH IN FINANCE (0 to 1). Prerequisite, permission of the instructor. Advanced research in business finance and investment. An informal seminar to discuss current research of doctoral candidates, faculty and others. Fall and spring. Staff.

887 [387] QUANTITATIVE METHODS IN FINANCE (3). Prerequisite, permission of the instructor. Review of information generating and optimizing models and their applicability to decision making in finance. Spring. Staff.

888 [388] SEMINAR IN FINANCIAL MARKETS (3). Prerequisite, permission of the instructor. Advanced methods in finance. Spring. Staff.

890 [390] STRATEGIC MANAGEMENT OVERVIEW (3). A seminar to provide a broad and current understanding of strategic management. Exposure to the entire field is emphasized. Fall. Staff.

891 [391] STRATEGIC FORMULATION (3). Prerequisite, BUSI 890. This seminar emphasizes both process and content issues to provide students with an in-depth understanding of strategy formulation topics. Spring. Bettis.

892 [392] STRATEGY IMPLEMENTATION (3). Prerequisites, BUSI 890 and 891. This seminar focuses on strategy implementation, with particular emphasis devoted to the process, systems and structures required for effective implementation. Spring. Staff.

899 [399] SEMINAR (3). Prerequisite, permission of the instructor. Individual research in a special field under direction of a member of the department. Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Department of Cell and Developmental Biology

www.med.unc.edu/wrkunits/2depts/biochem
VYTAS A. BANKAITIS, *Chair*

Professors

Vytas A. Bankaitis (4) Signal Transduction, Genetic Models for Neurodegenerative Disease in Mice, Yeast Genetics and Cell Biology
Patrick Brennwald (5) Cell Polarity, Tumor Suppressor, Vesicle Transport, Exocytosis, Rho GTPases
Keith W. T. Burridge (41) Cell Migration, Cell-Matrix and Cell-Cell Adhesion, Rho Family GTPases, Leukocyte Transendothelial Migration
Johnny L. Carson (6) Developmental Biology, Pathogenic Mechanisms Involving Mammalian Airways
M. Joseph Costello (50) Membrane Biophysics, Intercellular Junctions, Active Transport, Membrane Fusion, Electron Microscopy
Douglas M. Cyr (6) Cystic Fibrosis, Organelle Biogenesis, Protein Folding, Molecular Chaperones, Ubiquitin-Proteasome Pathway
Noelle A. Granger (42) Developmental Biology, Endocrinology, Neuroendocrinology
Kenneth A. Jacobson (39) Membrane Biology and Biophysics, Cell Migration, Video Image Analysis
Royce L. Montgomery (11) Invertebral Disc Lesions and Back Pain
Deborah A. O'Brien (51) Mammalian Spermatogenesis and Fertilization, Regulation of Sperm Motility, Contraception, Gene Targeting, and Animal Models
Michael G. O'Rand (38) Cell Biology, Immunology, Reproductive Biology
W. Cam Patterson (10) Cardiovascular
Peter Petrusz (13) Neurobiology, Reproductive Biology
Aldo Rustioni (15) Glutamate Receptors Expression and Regulation, Axonal Regeneration and the Cytoskeleton, Somatosensory Mechanisms
Michael D. Schaller (2) The Integrins, Protein Tyrosine Kinases and Signal Transduction
Kathleen K. Sulik (40) Developmental Toxicology, Embryology

Associate Professors

Cornelius J. Beckers (12) Signal Transduction, Cell Motility, Cytoskeleton, Infectious Diseases, Cell Biology
Mohanish P. Deshmukh (3) Neuronal Apoptosis, Molecular Mechanism of Programmed Cell Death, Regulation of Caspase Activation
Scott Hammond (008) Biochemical Mechanism for RNA Interference
Ellen R. Weiss (9) Regulatory Domains of G-Protein Coupled Receptors, Molecular Biology of Cellular Signaling Pathways

Assistant Professors

James Bear (14) Cell Motility, Actin Cytoskeleton, Coronins, Live-Cell Microscopy
Jay E. Brenman (10) Neuronal Development, Drosophila and Mouse Genetics, Dendrite and Axon Morphogenesis
Kurt Gilliland (16) Intercellular Junctions, Human Cataract, Electron/Confocal Microscopy
Edward Kernick
Da-Zhi Wang (12) Cardiovascular Development

Research Professor

Richard Weinberg (20) Quantitative Immunocytochemistry, Organization of Excitatory Synapses, Calcium Signaling in Dendritic Spines

Research Associate Professors

Shao-Yu Chen, Developmental Toxicology, Embryology
Shoji Osawa (16) Regulation of Signal Transduction Pathways by G Proteins
Richard Richardson (17) Molecular Biology of Sperm-Oocyte Interaction, Studies of Immunocontraception
Juli Valtschanoff, Electron Microscopy of Synaptic Proteins, Nitric Oxide, Spinal Pain Mechanisms

Research Assistant Professors

James Alb, Role of Phosphatidylinositol Transfer Protein Alpha in Mammalian Systems
Oleg Alekseev
Malika Boukhelifa
Alain Burette
Jr-Gang Cheng
Polina Danshina
Rafael Garcia-Mata
Martina Gentzch
Gerald W. Gordon (14) Instrument Development for Cell Biology Research
Ekhson Holmuhamedov
Durairaj Jeyaraj
Maryna Kapustina
Elizabeth Morin-Kensicki
Robert Peterson
Shubing Qian
Zenon Rajfur
Ioulia Shackelford
Patrick Vincent
Gabriel Weinreb
Erika Wittchen

Instructor

Linda Levitch

Professors Emeriti

Charles R. Hackenbrock
O'Dell W. Henson Jr.
William E. Koch (8) Developmental Biology
Jean M. Lauder

Program of Study

The Department of Cell and Developmental Biology of the School of Medicine offers a program of study leading to the doctor of philosophy degree. The primary purpose of the graduate program is to train students to become biomedical scientists. The program provides training for students whose research/teaching career objectives are faculty positions in medical school basic sciences departments. However, the flexibility of the program also provides for the training of students who seek careers in basic science as well as clinical science departments of medical schools, in other professional schools such as dental schools, in liberal arts academic departments such as biology, or in state, federal, private and industrial research laboratories. The program for the Ph.D. normally takes five to six years to complete. Persons interested in a combined M.D./Ph.D. program must be accepted into the School of Medicine and the departmental graduate program, whereupon the combined studies are scheduled in accordance with individual requirements.

Some of the department's areas of specialization are cell biology, developmental biology, neurobiology, reproductive biology, membrane biology, molecular biology, cell signaling and parasitology. Ph.D. students take graduate level courses in their first year as well as conduct laboratory rotations. Students who join the departmental graduate program at the end of year 1 are examined for advancement to candidacy. Ph.D. candidacy is followed by a dissertation based on original research is conducted under the supervision of a faculty adviser. Additional information is available on the departmental Web site (www-cellbio.med.unc.edu/grad/depttest/welcome.htm).

Admission Requirements

Admission to the departmental graduate program is via the unified Biological and Biomedical Sciences Program (BBSP) at UNC. A B.A. or B.S. degree is required for admission. Applicants are expected to have a strong background in the biological sciences, chemistry, physics and mathematics. Details of the application process is available at the BBSP Web site (www.med.unc.edu/bbsp). Briefly, the application should include transcripts, Graduate Record Examination (GRE) scores, three letters of recommendation and a personal statement outlining career goals.

Research Facilities

The department occupies 40,000 square feet of research and office space (in addition to teaching space), primarily in Taylor Hall and the Biomolecular Research Building in the School of Medicine. The department and its research laboratories are a biotechnological resource available for qualified scientists in the University, state and region. The laboratories house instrumentation for transmission, scanning and cryo electron microscopy, as well as equipment to prepare biological specimens for these techniques. The Electron Microscope Facility contains a multipurpose JOEL 820 scanning electron microscope and a high-resolution FEI-Philips Tecnai 12 transmission electron microscope. Ancillary facilities include fully equipped darkrooms and equipment for ultamicrotomy, critical point drying, rotary evaporation, sputter coating and a state-of-the-art, high-resolution Reichert freeze fracture system. A world class facility is available for optical imaging of all kinds, including digitized video microscopy, confocal microscopy and fluorescence lifetime imaging microscopy, two-photon confocal microscopy, nanovid microscopy and fluorescence recovery after photobleaching.

Assistantships and Other Student Aid

Students are supported by a stipend of $24,000 annually plus tuition, fees and medical insurance.

Courses for Graduates and Advanced Undergraduates

423 [123] DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (TOXC 423) (3). Emphasizes topics of current research interest relative to the genesis of environmentally caused and genetically based birth defects. One two-hour session per week (evening). Spring. (Alternate years.) Sulik.

607 [107] GROSS ANATOMY (4). Permission of the instructor. Primarily for medical students. Enrollment by availability of space and material. Fall; two lecture hours, six laboratory hours, eight weeks of spring. Sulik, staff.

610 [200] ADVANCED GROSS ANATOMY (4). Prerequisites, CBIO 607 and permission of the instructor. Detailed dissection of human body. Specific regions may be selected; topics include topographic, radiographic and cross-sectional anatomy.

627 [207] REGIONAL ANATOMY (3). Permission of the instructor. For students of oral surgery, surgical residents and graduate students.

643 [117] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (BIOC 643, MCRO 643, PHCO 643) (3). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Fall. Lee, Meissner, Parise.

644 [118] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (BIOC 644, MCRO 644, PHCO 644) (3). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Cox, Lee, Meissner, Parise.

741 [041] INTRODUCTION TO HUMAN ANATOMY (3).

750 [250] APPLIED BIOSTATISTICS (PATH 750, PHCO 750, TOXC 750) (2).

790 [90] INTRODUCTION TO HUMAN ANATOMY (3).

791 [191] GROSS ANATOMY FOR PHYSICAL THERAPISTS (PHYT 791) (6). Prerequisites, BIOL 276 and 276L and permission of the instructor. Fundamental principles and concepts of human gross anatomy for physical therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. Three lecture hours and six laboratory hours a week. Fall. Kernick.

793 [193] FUNCTIONAL NEUROANATOMY (PHYT 793) (3). Prerequisites, CBIO 791, CBIO 607 or equivalent and permission of the instructor. Study of basic structure of the brain and spinal cord, including both lecture and laboratory. Primarily for physical therapy students. Four hours a week. Spring. Kernick.

804 [104] INTRODUCTION TO MEDICAL CELL BIOLOGY (1). Introduction to the structure and function of cell membranes, membranous organelles, the nucleus and the filamentous components of the cytoplasm. Fall. Burridge. For medical students only.

805 [105] GROSS ANATOMY (5). Systematic approach to gross anatomy emphasizing a regional approach stressing head and neck anatomy. Primarily for dental students. Fall. Levitch.

Courses for Graduates

610 [200] ADVANCED GROSS ANATOMY (4). Prerequisites, CBIO 607 and permission of the instructor. Detailed dissection of human body. Specific regions may be selected; topics include topographic, radiographic and cross-sectional anatomy.

627 [207] REGIONAL ANATOMY (3). Permission of the instructor. For students of oral surgery, surgical residents and graduate students.

890 [320] ADVANCED TOPICS IN CELL AND DEVELOPMENTAL BIOLOGY (Var.). Prerequisite, permission of the instructor. Seminar/discussion course dealing with advanced topics in modern cell biology and/or developmental biology. Based mainly on discussion of current literature. Fall and spring. Staff.

891A [321A/] CONTEMPORARY PROBLEMS (3). Prerequisite, permission of the instructor. Analysis of grant proposals dealing with advanced topics in modern cell biology and/or developmental biology. Spring, fall. Bankaitis.

892b [321B] CONTEMPORARY PROBLEMS (3).

893 [324] CELL BIOLOGY I (4).

894 [325] CELL BIOLOGY II (4).

899 [209] ELECTRON MICROSCOPY-PRINCIPLES AND APPLICATIONS (3). Permission of the instructor. Lectures on scanning, transmission, high voltage, freeze fracture, analytical and immunoelectron microscopy. Laboratory training in preparation of biological specimens, operation of scanning and transmission microscopes, and darkroom procedures. Three lecture hours and 12 laboratory hours per week. First summer session. Costello.

910 [310] RESEARCH (2 or more). Credit to be arranged in individual cases. Fall, spring and summer. Staff.

915 [315] RESEARCH LABORATORY APPRENTICESHIP (2). Prerequisite, enrollment in the cell biology and anatomy graduate program. A course for first- and second-year graduate students in cell biology and anatomy, consisting of a research project of limited scope pursued under the supervision of a faculty member. Fall, spring and summer. Staff.

993 [393] MASTER'S THESIS (3).

994 [394] DOCTORAL DISSERTATION (3).

Department of Cell and Molecular Physiology

www.med.unc.edu/physiology
JAMES M. ANDERSON, *Chair*

Professors

James M. Anderson (78) Epithelial Cell Biology, Tight Junction Structure and Function and the Physiologic Implications of Paracellular Selectivity.
William J. Arendshorst (25) Cell and Integrative Biology of Vascular and Nephron Function, Interactions of Endothelial and Vascular Smooth Muscle Cells, Receptors and Signal Transduction, Regulation of Cytosolic Calcium Concentration, Pathogenic Mechanisms of Hypertension
Richard E. Cheney (69) Motor Proteins, Cytoskeleton, Neuronal Cell Biology
James E. Faber (49) Vascular Physiology, Signal Transduction of Vascular Smooth Muscle and Fibroblast Cells, Atherosclerosis, Adrenergic Receptors
Paul B. Farel (5) Regulation of Neuron Number, Development of Specific Neural Connections, Regeneration
Michael F. Goy (60) Biochemistry and Physiology of Excitable Cells, Second Messenger Mechanisms in Signal Transduction, Epithelial Biology, Natriuretic Peptides
Susan J. Henning (98), Intestinal Stem Cells - Biological Properties and Potential for Therapeutic Application
Pauline K. Lund (50) Growth Factors, Cytokines, Gastrointestinal Growth, Molecular Biology, Signal Transduction, Aging and Memory Loss
Anthony-Samuel LaMantia (73) Induction and Patterning of the Mammalian Forebrain, Inductive Signaling Mechanisms in the Developing and Regenerating Nervous System, Function of Genes Associated with Human Developmental Disorders
Paul Manis (81) Cellular Mechanisms of Auditory Information Processing, Synaptic Plasticity, Ion Channels
Gerhard W. D. Meissner (26) Mechanisms in Excitation-Contraction Coupling in Muscle, Ion Channels
Roy C. Orlando (99) Ion transport and barrier function as mucosal defense in esophageal and Barrett's epithelium; mechanisms by which acid/pepsin injures squamous epithelium leading to esophagitis and alters Barrett's epithelium, promoting dysplasia and malignancy
Edward R. Perl (18) Physiological and Molecular Bases for Pain and Other Somatic Sensations, Spinal Cord Synaptic Mechanisms
Daniel N. Pomp (89) Genetics of Growth, Obesity, and Body Weight Regulation in Animal Models
Lola M. Reid (67) Hepatic Stem Cell and Maturational Lineage Biology, Synergies between Extracellular Matrix and Hormones in the Regulation of Gene Expression
Robert L. Rosenberg (63) Regulation of Ion Channels
Aldo Rustioni (30) Somatosensory System; Connections, Neurotransmitters, and Interneuronal Integration
Robert Sealock (32) Cell Biology and Biochemistry of the Neuromuscular Junction, Proteins Involved in Duchenne Muscular Dystrophy
William Snider (74) Developmental Regulation by Neuronal Growth Factors
Ann E. Stuart (41) Aspects of Synaptic Transmission from Photoreceptors, Histaminergic Synapses
Tony G. Waldrop (77) Genetic Aspects of Hypertension, Developmental Neurobiology, Effects of Hypoxia on Brainstem Neurons
Barry L. Whitsel (23) Neuronal Mechanisms of Somatic Sensation

Associate Professors

Eva Anton (76) Molecular Analysis of Neuronal Migration and Development of the Cerebral Cortex
Manzoor Bhat (79) Cell Adhesion, Axon Glial Interactions, Blood Nerve Barrier, Signal Transduction, Synaptogenesis
Carol A. Otey (72) Mechanisms of Cell Adhesion, Cell Migration and Cytoskeletal Organization, and Neuronal Cell Biology
Scott Randell (75) Airway Epithelial Cell Biology-Stem Cells, Host Defense and Response to Injury

Assistant Professors

Kathleen Caron (80) Gene Targeted Models of Human Disease, Reproductive Biology, Cardiovascular Biology, G-Protein Coupled Receptor Signaling
Suk-Won Jin (92) Endothelial Cell Specification and Vascular Tube Morphogenesis
Benjamin Philpot (82) Mechanisms of Experience-Dependent Synaptic Plasticity in Visual Cortex
John F. Rawls (91) Molecular and Genetic Analysis of Host-Microbial Interactions in the Vertebrate Digestive Tract
Nobuyuki Takahashi (84) Mechanism of Hypertension, Diabetic Complications, and Obesity Using Genetically Engineered Animals
Eleni Tzima (88) Mechanisms of Vascular Endothelial Cell Signaling and Angiogenesis in Response to Hemodynamic Stimuli
Mark J. Zylka (90) Molecules and Mechanisms for Pain

Research Professor

C. William Davis (51) Airway Epithelial Cell Physiology

Research Associate Professor

Nicholas G. Moss (94) Biological Signal Transduction

Research Assistant Professor

Robert Tarran (87) Regulation of Airway Epithelial Ion and Mucus Transport

Professors Emeriti

Robert G. Faust
Enid R. Kafer
Alan Light
David L. McIlwain
Joseph H. Perlmutt
Lloyd R. Yonce

Physiology is the study of the biological, chemical and physical processes that underlie the functions of living cells and organs. Research in physiology uses tools from chemistry, mathematics, molecular biology and physics to identify regulatory mechanisms that operate at levels of complexity ranging from the subcellular to the organismic.

Curriculum

The Department of Cell and Molecular Physiology offers a program of study leading to the Ph.D. or M.D./Ph.D. degree. The M.S. degree is offered only under special circumstances. Research opportunities cover molecular, cellular and systems physiology with an emphasis on mechanisms of disease. Faculty specialties include neurophysiology, endocrinology, and gastrointestinal, cardiovascular and renal physiology. The Ph.D. program typically requires four to five years of study. The first two years of graduate study include core and elective course work, laboratory rotations, seminar courses and research. The curriculum is individualized to develop the analytical, research, and communication skills necessary to carry out successful dissertation research. All students typically take the following courses: PHYI 703, molecular and integrative physiology, one advanced physiology course plus three electives. Requirements may be waived for students with previous graduate-level course work.

Research rotations introduce students to faculty laboratories and develop and broaden research experience. Students join the lab of the research adviser within the first year of the program. Journal clubs, a class in oral and written communication, the seminar program and a research-in-progress series provide mechanisms for students to develop research and analytical skills. Teaching experience is available in pre-

professional courses, graduate school and medical school courses. The qualifying examination is scheduled during the second year. Students submit the dissertation proposal in year three and complete research and writing in years four and five.

Research Facilities

The department occupies the newly completed Medical Biomolecular Research Building and the adjoining Neuroscience Research Center. Faculty laboratories are equipped for research and training in all methods of biological research, including biophysics, molecular biology, biochemistry, immunochemistry and whole-animal studies. UNC-Chapel Hill has outstanding centers for the development and breeding of transgenic and gene-knockout mice for molecular biology/recombinant DNA-related research, cardiovascular biology and cystic fibrosis and pulmonary medicine as well as a newly constructed zebrafish facility. Researchers in the department routinely collaborate with members of other School of Medicine departments and centers, with laboratories at Duke University and with researchers at NIEHS in nearby Research Triangle Park.

Financial Aid

All students in good academic standing receive a stipend, tuition scholarship and health insurance. Many students compete successfully for individual predoctoral fellowships from the AHA, NIH and NSF, and for competitive awards from The Graduate School. Interdisciplinary training grants in vascular biology, nutrition, cell and molecular biology, and integrative medicine support students across the campus. In addition, the department and individual labs provide funds for students to attend national and international research meetings and specialty courses on- and off-campus.

Placement of Graduates

Recent graduates are working as postdoctoral fellows and faculty members at colleges and universities, as bench scientists in the biotechnology and pharmaceutical sectors and as scientific advisers in both clinical and basic research settings.

Requirements for Admission

Applications for all 12 School of Medicine basic science graduate programs are processed through the Biomedical and Biological Sciences Program and spend their first year in that program before transferring to a degree program. Majors in cell and molecular physiology typically have an undergraduate record that includes course work in organic chemistry and biochemistry, two semesters of calculus and physics, and appropriate course work in the biological sciences, typically including zoology, genetics, cell biology and molecular biology. All applicants are required to submit scores on the GRE aptitude test, a written statement, transcripts and a minimum of three letters of recommendation. Applications are welcome at any time, but should be received by January 1 to receive priority consideration for financial support.

Courses for Graduate and Professional Students

701 [210] PHYSIOLOGY LABORATORY ROTATION (1–6). Prerequisite, permission of the director of graduate studies. Rotations in faculty laboratories introduce methods and techniques in physiology. Individual projects provide an opportunity to explore potential dissertation topics. Fall, spring and summer. Staff.

703 [125] MOLECULAR, CELLULAR AND INTEGRATIVE PHYSIOLOGY (1–4). Prerequisite, permission of the instructor. Molecular and cellular basis of organ system function; integration of systems to maintain the normal state. Understanding of normal physiology is amplified by examples from human disease and mouse models. Fall. Sealock, staff.

705 [205] COMMUNICATING SCIENTIFIC RESULTS (1). Practice in oral and written communication evaluated by peers and faculty. Includes delivery of coached presentations on topics in physiology and preparation of writing assignments typically encountered in scientific life. Fall. Stuart.

706 [206] COMMUNICATING SCIENTIFIC RESULTS (1). Practice in oral and written communication evaluated by peers and faculty. Includes delivery of coached presentations on topics in physiology and preparation of writing assignments typically encountered in scientific life. Spring. Stuart.

710 [201] MEDICAL NEUROBIOLOGY (NBIO 710) (1–3). Prerequisite, permission of the course director. A special section (for physiology graduate students only) of the neurobiology course for medical students. Structural and functional organization is analyzed at the level of the cell membrane, the neuron and integrated neuronal systems. Spring. Goy, staff.

714 [114] PHYSIOLOGY (DENT 114) (4). This basic physiology course introduces students to the functions of and interactions between the various systems of the body. Particular emphasis is placed on those concepts of specific relevance for students and practitioners of dentistry. The course also provides students with a solid physiological background for subsequent courses within the dentistry curriculum. Spring. Moss, staff.

720 [200] HUMAN PHYSIOLOGY (1–5). Prerequisite, permission of the course director. A special section (for physiology graduate students only) of the course for medical students. The course provides a general consideration of cell function and systemic physiology. Six lecture hours per week. Spring. Goy, staff.

722A [222A] CELLULAR AND MOLECULAR NEUROBIOLOGY: INTRODUCTION (BIOC 722A, NBIO 722A, PHCO 722A) (2). Prerequisite, permission of course director. Introductory section covers basic neurobiology, including neuronal cell biology, action potentials, synaptic potentials, molecular biology and neuroanatomy. Course meets three weeks with six lecture hours per week. Fall. Stuart.

722B [222B] CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (BIOC 722B, NBIO 722B, PHCO 722B) (2). Prerequisite, permission of course director. The genesis of electrical impulses in the nervous system is considered with an emphasis on membrane potentials, voltage-gated ion channels and structural features of neurons that influence coding. Course meets for six weeks with six lecture hours per week. Fall. Stuart.

722C [222B] CELLULAR AND MOLECULAR NEUROBIOLOGY: RECEPTORS (BIOC 722C, NBIO 722C, PHCO 722C) (2). Prerequisite, permission of the instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

723A [223A] CELLULAR AND MOLECULAR NEUROBIOLOGY: Synaptic Mechanisms and Intracellular Signaling (BIOC 723A, NBIO 723A, PHCO 723A) (3). Prerequisite, permission of the course director. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tyrosine kinases. Course meets for five weeks with six lecture hours per week. Spring. Stuart.

723B [223B] CELLULAR AND MOLECULAR NEUROBIOLOGY: ANATOMY AND FUNCTION OF SENSORY AND MOTOR SYSTEMS (BIOC 723B, NBIO 723B, PHCO 723B) (3). Prerequisite, permission of course director. Explores the mechanisms regulating the release of neurotransmitters from nerve terminals, including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters, and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Spring. Stuart and faculty.

724 [122] DEVELOPMENTAL NEUROBIOLOGY (NBIO 724) (3). Prerequisites, NBIO 722 and permission of the instructor. A survey of nervous system development emphasizing detailed analysis of selected research topics such as neuronal induction, neural crest development, neuronal differentiation, synapse formation, neurotrophic factors, glial development and the effects of experience. Fall. S. Crews, Polleux.

751 [220] SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the director of graduate studies. Fall. Staff.

752 [221] SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the director of graduate studies. Spring. Staff.

775 STEM CELLS AND MATURATIONAL LINEAGE BIOLOGY (4). Biology 111; Chemistry 101, 102, 241 or equivalents. All tissues are organized with stem cell compartments giving rise to maturational cell lines with lineage-dependent phenotypic characteristics. Investigators discuss research in stem cell biology and regenerative medicine. Fall. Reid.

800 [300] TEACHING PHYSIOLOGY (1–3). Prerequisite, permission of the course director. Introduces the principles of teaching physiology. Provides students the opportunity to plan instruction and to teach with increasing degrees of responsibility. The teaching internship is under the direct supervision of a faculty mentor. Fall and spring. Faculty.

824 [224] PAIN AND SOMATIC SENSATION (NBIO 824) (2). Prerequisites, PHYI 720 or equivalent and permission of the instructor. Consideration of peripheral and central neural mechanisms for somatic sensation with particular emphasis on pain. Spring. Perl.

832 RESPIRATORY PHYSIOLOGY: DEFENSE MECHANISMS IN THE AIRWAYS (1–4). Prerequisite, PHYI 703 or equivalent. The integrated defense mechanisms that protect the airways and lung from inhaled allergens, irritants, particulates, and pathogens. Topics include transepithelial ion transport, mucociliary clearance, and innate immune responses. Spring. Davis, Tarran, Randell.

833 GASTROINTESTINAL PHYSIOLOGY: GROWTH, CANCER, INFLAMMATION AND THE MICROBIOME (1–3). Prerequisite, PHYI 703 or equivalent. Roles of growth factor and cytokine signaling, and the intestinal microbiome in normal intestinal growth, inflammation or colon cancer. Molecular, cellular, genomic, model organisms and translational medicine approaches. Spring. Lund, Rawls.

PHYI 835 (239C) CNS ORGANIZATION (1). Primary literature explores how the nervous system is organized, integrates information and adapts. Spring. Farel, Perl.

PHYI 836 (239B) EXCITABLE MEMBRANES, RECEPTORS, CHANNELS AND SYNAPSES (1–4). Basic neurophysiology of excitable membranes, channels and synapse as the basis of neuronal communication. Spring. Rosenberg, Sealock.

PHYI 839 ENDOTHELIAL CELLS IN HEALTH AND DISEASE (1–4). Prerequisite, PHYI 703 or equivalent. Literature-based survey of endothelial cell biology including development, angiogenesis, environmental influences and disease models . Spring. Caron, Jin, Tzima.

PHYI 840 [240] RENAL/CARDIOVASCULAR SYSTEMS (1–4). Prerequisites, PHYI 703 and permission of the instructor. Blood pressure control in normal, diseased and genetically modified animals. Physiology and pathophysiology of the renal and cardiovascular systems. Fall. Arendshorst, Faber, Goy, staff.

850 [290] SEMINAR IN NEUROBIOLOGY (BIOC 850, NBIO 850, PHCO 850) (3). Prerequisite, permission of the director of the neurobiology curriculum. An intensive consideration of selected topics and problems. The course focuses on the development of presentation and evaluation skills of the trainees. Spring. Faculty of the neurobiology curriculum.

891 [211] SPECIAL TOPICS IN PHYSIOLOGY (NBIO 791) (1–5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of study of selected topics such as membrane function, transport physiology, renal physiology, etc. Fall. Staff.

892 [212] SPECIAL TOPICS IN PHYSIOLOGY (NBIO 792) (1–5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of study of selected topics such as membrane function, transport physiology, renal physiology, etc. Spring. Staff.

901 [301] RESEARCH IN PHYSIOLOGY (3–10). Fall. Staff.

902 [302] RESEARCH IN PHYSIOLOGY (3–10). Spring. Staff.

903 [303] RESEARCH IN PHYSIOLOGY (3–10). Summer. Staff.

993 [393] MASTER'S THESIS (3 or more). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Department of Chemistry

www.chem.unc.edu
MICHAEL T. CRIMMONS, *Chair*

Professors

Tomas Baer (1) Physical Chemistry
Max L. Berkowitz (30) Physical Chemistry
Maurice S. Brookhart (2) Organic and Organometallic Chemistry
Michael T. Crimmins (39) Organic Chemistry
Joseph M. DeSimone (49) Synthetic Polymer Chemistry
Malcolm D. E. Forbes (48) Organic and Physical Chemistry
Gary L. Glish (40) Analytical Chemistry
Eugene A. Irene (38) Electronic Materials, Solid State Chemistry
Charles S. Johnson Jr. (18) Physical Chemistry
James W. Jorgenson (36) Analytical Chemistry
Paul J. Kropp (20) Organic Chemistry
Susan T. Lord (50) Biological Chemistry
Thomas J. Meyer (23) Inorganic Chemistry
Royce W. Murray (25) Analytical Chemistry
Lee G. Pedersen (26) Physical Chemistry
Gary J. Pielak (46) Biological Chemistry
J. Michael Ramsey (62) Analytical Chemistry
Michael Rubinstein (43) Polymer Physical Chemistry
Edward T. Samulski (44) Polymer Physical Chemistry
Thomas N. Sorrell (35) Organic Chemistry
Linda L. Spremulli (28) Biological Chemistry
Joseph L. Templeton (31) Inorganic Chemistry
Nancy L. Thompson (41) Physical and Biological Chemistry
H. Holden Thorp (51) Inorganic Chemistry
R. Mark Wightman (47) Analytical and Neurochemistry
Richard V. Wolfenden (65) Biological Chemistry

Associate Professors

Valerie Sheares Ashby (61) Polymer and Materials Chemistry
Dorothy A. Erie (11) Physical and Biological Chemistry
Michel R. Gagné (22) Inorganic, Organic and Polymer Chemistry
Wenbin Lin (60) Inorganic Chemistry
John M. Papanikolas (52) Physical Chemistry
Matthew Redinbo (55) Biological Chemistry
Cynthia K. Schauer (45) Inorganic Chemistry
Mark H. Schoenfisch (57) Analytical and Materials Chemistry
Sergei S. Sheyko (59) Polymer and Materials Chemistry
Marcey Waters (56) Organic Chemistry
Kevin M. Weeks (53) Biological Chemistry

Assistant Professors

Todd L. Austell (70) Chemistry Education, Academic Advising, Lab Curriculum Development
Brian P. Hogan, Chemistry Education, Lab Curriculum Development

Jeffrey S. Johnson (58) Organic Chemistry
Garegin A. Papoian (63) Physical Chemistry
Domenic Tiani (71) Chemistry Education, Academic Advising, Lab Curriculum Development
Muhammad N. Yousaf (64) Biological Chemistry

Professors Emeriti
Richard P. Buck
Maurice M. Bursey
Francis N. Collier
James L. Coke
Ernest L. Eliel
Richard G. Hiskey
Richard C. Jarnagin
Donald C. Jicha
William F. Little
Robert G. Parr

The Department of Chemistry offers graduate programs leading to the degrees of master of arts, master of science (nonthesis) and doctor of philosophy in the fields of analytical, biological, inorganic, organic, physical and polymer and materials chemistry. Close interaction between the departments of Chemistry, Physics, Biochemistry and Environmental Sciences and Engineering reinforces the broad nature of the graduate research program.

Doctor of Philosophy

The Ph.D. degree in chemistry is a research degree and students normally begin research during the first year in graduate school. As soon as the entering student has selected a research advisor, an advisory committee is established to develop an appropriate course of study designed to meet individual needs. The Ph.D. degree consists of completion of a suitable program of study, a preliminary doctoral oral examination, a written comprehensive examination that is satisfied by cumulative examinations, an original research project culminating in a dissertation, and a final oral examination.

Master of Arts

The master of arts degree requires a minimum of 30 semester hours of credit. Courses are determined by the student's advisory committee. A written comprehensive examination (which may be satisfied by cumulative examinations), a thesis and a final oral examination are also required. Admission to the Ph.D. program after completion of the M.A. degree in the department requires approval by the Chemistry Graduate Studies Committee.

Master of Science (nonthesis)

The master of science (nonthesis) degree requires a minimum of 30 semester hours. The candidate must earn at least 24 hours of graduate credit in chemistry and allied subjects, which may include graduate seminars numbered 700 or higher but may not include CHEM 921, 931, 941, 951, 961 and 981 (referred to collectively as "9X1"). As a substitute for the thesis the candidate must earn a minimum of three hours of CHEM 992 (master's nonthesis option). The student's program of study is determined by the student's advisory committee. A written report submitted to the student's research director describing work done while registered for CHEM 992 and a written examination (which may be satisfied by cumulative examinations) are also required. Admission to the Ph.D. program after completing the M.S. degree in the department requires approval by the Chemistry Graduate Studies Committee.

Research Interests

Analytical. Chemical separations: Development of instrumentation for ultra-high pressure capillary liquid chromatography, capillary electrophoresis and combined two-dimensional separations. Applications include proteomics and measurement of peptide hormones in biological tissues. Mass spectrometry of biological, environmental, organic and polymeric compounds; tandem MS, ion activation, ion molecule reactions; instrument development. Electrochemistry: New methods for study of biological media, neurotransmitters small spaces, redox solids, chemically modified surfaces, nanoparticle chemistry, and quantum size effects including the analytical chemistry of nanoparticles. Chemical microsystems: Microfabricated fluidics technologies, or lab-on-a-chip devices, are being developed to address biological measurement problems such as protein expression, cell signaling and cancer diagnostics. Miniaturized mass spectrometers, in addition to microfluidics, are being developed for environmental monitoring. Nanoscale fluidics devices are being developed for single molecule DNA sequencing and chemical sensing. Biomaterials: Synthesis and characterization of in vivo sensor membranes, medical device coatings, nanoparticle therapeutics, and their physiological impact; analysis of proteins and cells at surfaces.

Biological. Kinetics and mechanisms of complex biochemical processes; mechanism of protein biosynthesis; metabolic regulation; gene organization and regulation of gene expression; structural studies of macromolecules; protein structure and function using nuclear magnetic resonance spectroscopy, protein folding and site-directed mutagenesis; in-cell NMR; the thermodynamics of protein-protein interactions; characterization of protein/DNA complexes using scanning force microscopy and rapid mixing techniques; RNA structure in vivo, assembly of complex RNA-protein architectures, protein-facilitation of RNA catalysis; nucleic acid-based biosensors; chemical synthesis of peptides and proteins; protein engineering through chemical synthesis; biochemical studies of the serum complement and clotting cascades; molecular immunology; computer graphics and molecular modeling of biomolecules; mathematical methods for comparison of genetic sequences; cell surface biophysics; fluorescence microscopy and spectroscopy; cell migration on tailored surfaces; small molecule and protein microarray development; live cell fluorescence microscopy.

Inorganic. Physical inorganic chemistry: Electronic structure of transition metal complexes; photochemistry and electrochemistry of metal complexes; molecular orbital theory, nuclear magnetic resonance and electron paramagnetic resonance spectroscopies; x-ray crystallography; infrared and Raman spectroscopies. Chemistry of transition metal complexes: Synthesis of transition metal compounds, organometallic chemistry including metal-catalyzed organic reactions; reactions of coordinated ligands; kinetics and mechanisms of inorganic reactions; metal cluster chemistry; chiral supramolecular chemistry. Materials chemistry: Molecular precursors to materials; solid state lattice design; metal-ion containing thin films; metal-polymer complexes; functional coordination polymers; chiral porous solids. Bioinorganic chemistry: Reactivity of oxidized metal complexes with nucleic acids, photo-induced DNA cleavage, synthesis and characterization of model complexes for metalloenzymes.

Organic. Synthesis and biological reactions of natural products; peptide synthesis; protein engineering; structure-function studies on polypeptides and proteins; mechanistic and synthetic studies in organometallic chemistry; catalysis using organometallic complexes; nuclear magnetic resonance; kinetics; organosulfur and organophosphorus chemistry; surface effects in chemical behavior; chemistry of reactive

intermediates including carbocations, carbanions, carbenes and radical pairs; new synthetic methods including asymmetric synthesis; stereochemistry and conformational analysis; design and synthesis of models for metalloenzymes; epr investigations of electronic couplings in high-spin organic molecules; spectroscopic studies of free radicals; synthesis and characterization of well-defined polymeric materials; synthesis of materials for use in microelectronics; homogeneous and heterogeneous polymerizations in supercritical fluids; synthesis of engineering polymers; molecular recognition.

Physical Chemistry. Surface science: Electron and optical spectroscopies of surface complexes, thermal desorption and isotopic tracer measurement on species of submonolayer coverage, surface etching and deposition initiated by electric discharges, ion beams and laser beams, mechanisms of reactive etching. Gas-surface energy transfer and catalytic reactivity probed by laser spectroscopies. Molecular dynamics: Photoionization and multi-photonionization mass spectroscopy, state-to-state ion molecule reactions, crossed molecular beam scattering, molecular motion and reaction rates in solutions examined by photon correlation spectroscopy and holographic relaxation spectroscopy, laser-induced vibrational dynamics. Biophysical chemistry: Membrane phenomena, physical chemistry of DNA complexes, nonlinear kinetics and cell differentiation, phospholipid Langmuir-Blodgett films, time-resolved fluorescence microscopy, laser light scattering applied to protein aggregation and the determination of mechanical properties of biological gels, dynamics in liquids. Photochemistry: Photoelectron spectroscopy of molecules, photolytic charge separation and transport in organic solids and liquids, multi-photonionization and fragmentation, state-to-state dynamics.

Molecular Spectroscopy. Laser spectroscopy in cooled molecular beams of transient species, ions and molecular complexes, subdoppler infrared spectroscopy, ion photodissociation studies, development of spectroscopic techniques, double resonance spectroscopy, pulsed field gradient NMR and NMR imaging. Application of optical and mass spectroscopies to the study of atmospheric chemistry.

Theoretical Chemistry. Quantum chemistry, density functional theory, quantum biology of neurotransmitters and pharmacological agents, energy minimization, protein dynamics, cooperativity, molecular graphics, mutagenesis, statistical mechanics of a liquid phase, structure and dynamics of aqueous solutions, kinetics in condensed phases, mechanical properties of polymers, state-to-state chemistry, reactions and energy transfer at solid surfaces. Polymer properties: Preparation of and nonlinear optical effects in polymeric systems, self-organized polymers, and liquid crystalline materials.

Polymer and Materials Chemistry. Many challenging problems in modern science and technology are related to the preparation, properties and utilization of novel functional materials. The polymer chemistry, drug delivery and chemical microelectronics programs represent parts of the multidisciplinary effort in this field. The many-pronged approach includes synthesis and molecular characterization of well-defined block and graft copolymers; design of multifunctional monomers and polymers, preparation of new engineering thermoplastics and liquid crystalline materials; synthesis, modification and processing of polymers in supercritical carbon dioxide; chemical design of hybrid polymers for catalysis and photoredox activity, polymers for imprint lithography and nanomolding, and defined microstructures. Recent efforts funded by the National Cancer Institute and NIH for employing lithographic techniques from the electronics industry to make organic nanoparticles for the detection, diagnosis and treatment of diseases, especially cancer. Chemical microelectronics is focused on preparation of organic and inorganic electronic materials; microscopic patterning of thin films using novel techniques (plasma, ion beam, laser beam, etc.); kinetics of etching and film formation; characterization of mechanical, electronic and optical properties; spatially resolved chemical analysis of surfaces, interfaces, and thin films and microstructures. A broad variety of expertise includes visualization and probing of submicrometer surface structures by scanning probe microscopy, characterization of polymer dynamics by NMR techniques and light scattering, measurement of molecular conductivity, and analytical as well as computational and numerical methods in polymers.

Biotechnology. The University has instituted a program in molecular biology and biotechnology. This program is an umbrella covering faculty and their research programs located in various departments including Biochemistry and Biophysics, Microbiology, Pathology, Biology and Chemistry. Some of the research being carried out in this field includes recombinant DNA technology, molecular genetics, atomic force microscopy, protein biosynthesis, enzymology, protein engineering, monoclonal antibodies, protein molecular dynamics, molecular modeling and site-directed mutagenesis. Attention is drawn to the possibility of arranging, through consultations with staff of the departments of Chemistry and Physics, a program combining course work in the two departments with thesis research in either department. Such a program would provide training in an area in which methods of theoretical and experimental physics are applied to chemical problems.

Facilities and Equipment

Research is carried out in the William Rand Kenan Jr. Laboratories, a facility of 130,000 square feet completed in 1971, and the W. Lowry and Susan S. Caudill Laboratories, an exciting new facility of 71,000 square feet completed in 2006. The undergraduate laboratories are housed in the modern John Motley Morehead Laboratories, completed in 1986. Included in the department are some major facilities managed by Ph.D.-level staff scientists. The NMR laboratory includes six high-resolution FT-NMR spectrometers ranging from 300 to 600 MHz for liquids: 300 MHz, two 400 MHz and 500 MHz Bruker spectrometers, and 300 MHz and 600 MHz Varian spectrometers. There is also a Bruker 360 MHz wide bore FT-NMR spectrometer suitable for solid polymeric samples with magic angle spinning. The MS laboratory houses a Bruker BioTOF II Reflectron Time of Flight Mass Spectrometer (ESI/nESI), an Agilent HPLC Quadrupole Mass Spectrometer (ESI, APCI), and a Micromass Quattro II Triple Quadrupole Mass Spectrometer. The x-ray laboratory is equipped with a new Bruker AXS SMART APEX2 single crystal diffractometer and Rigaku Multiflex powder diffractometer.

Computing services are among the most important for modern research. The University computing resources that currently reside in Information Technology Services (ITS) include a SGI Altix 3700bx2 system with 128 Intel Itanium2 processors (1600MHz), a Dell cluster with 520 PowerEdge 1855 servers with dual Intel EM64T 3.6 GHZ processors (total 1040 processors), a Beowulf Linux cluster with 135 Dual processor servers, an IBM 690 (32 processors), and a variety of specialty machines that provide services for statistics, bioinformatics, and database applications. A number of the individual research laboratories in Chemistry own Silicon Graphics- or Linux-based workstations. Numerous software packages of interest to chemical, biochemical and materials researchers are maintained for use on central systems

by the ITS Research Computing group (Accelrys, Gaussian, MolPro, NWChem, CPMD, AMBER, Gromacs, Felix, Sybyl, SAS, Stata, Mathematica, ECCE, Gaussview, etc). The combined hardware and software resources are tailored to meet the needs of a broad range of chemists working on applications in quantum mechanics, molecular dynamics, NMR, X-RAY, structural biology and bioinformatics.

To support the research programs, the department provides a number of services. Instrument, glass and electronics shops are provided to assist in construction and maintenance of specialized equipment. Technicians are also available to run certain specialized instruments.

The William Rand Kenan Jr. Chemistry Library is currently being housed in temporary quarters in the Wilson Library annex and is scheduled to move into "New Venable" upon its completion in 2009. During this temporary period the Chemistry Library is sharing space and combining some services with the Zoology Library. The entrance to the combined Chemistry/Zoology Library is on the south side of Wilson Library, across the street from the Bell Tower. Most Chemistry Library journal subscriptions and databases are available online for 24-hour access from campus workstations and other workstations that meet licensing requirements. The Chemistry collection also includes many print reference works and monographs that are available for checkout or use in the reading room when the library is open. Reference and instructional services are also available at the library service desk and by arrangement with library staff.

Financial Aid and Admission

The department awards a number of industrial fellowships and predoctoral research and teaching appointments. All outstanding prospective graduate students who apply for admission/support are automatically considered for fellowships.

There are more than 200 graduate students in the department. All are supported either as teaching assistants (27 percent), research assistants (65 percent), or as fellows (8 percent) supported by The Graduate School, industry or the United States government. The duties of the teaching assistants include the preparation for and supervision of laboratory classes in undergraduate courses and the grading of laboratory reports.

Applications for assistantships and fellowships should be made before the end of January, although applicants for assistantships are considered after that date. All applicants (international and domestic) must take the Graduate Record Examination (GRE). All international students whose native language is not English must take the Test of English as a Foreign Language (TOEFL) examination in addition to the Graduate Record Examination. However, international students who hold a degree from a university in the United States may be exempt. Both the TOEFL and the GRE should be taken as early as possible for fall acceptance, preferably in October.

Application forms for admission/support, as well as information about the department, should be obtained from the Chemistry Department Web site, www.chem.unc.edu. Questions may be directed to chemgs@unc.edu.

Courses for Graduates and Advanced Undergraduates

396 [101] SPECIAL PROBLEMS IN CHEMISTRY (1–9). Prerequisite, to be determined by consultation with vice chair of undergraduate studies. Equivalent of one to three hours a week. Fall and spring. Chemistry faculty.

420 [120] INTRODUCTION TO POLYMER CHEMISTRY (APPL 420) (3). Prerequisite, CHEM 261 or 261H. Pre- or corequisites, CHEM 262 or 262H, and 262L or 263L. Chemical structure and nomenclature of macromolecules, synthesis of polymers, characteristic polymer properties. Fall. Organic and physical chemistry faculty.

421 [121] SYNTHESIS OF POLYMERS (APPL 421, MTSC 421) (3). Prerequisites, CHEM 251 and 262 or 262H. Synthesis and reactions of polymers; various polymerization techniques. Fall. Organic and inorganic chemistry faculty.

422 [122] Physical Chemistry of Polymers (APPL 422, MTSC 422) (3). Prerequisites, CHEM 420 and 481. Polymerization and characterization of macromolecules in solution. Spring. Physical chemistry faculty.

423 [123] INTERMEDIATE POLYMER CHEMISTRY (APPL 423, MTSC 423) (3). Prerequisite, CHEM 422. Polymer dynamics, networks and gels. Spring. Chemistry faculty.

430 [130] INTRODUCTION TO BIOLOGICAL CHEMISTRY (BIOL 430) (3). Prerequisites, CHEM 262 or 262H, 262L or 263L, and BIOL 101. The study of cellular processes including catalysts, metabolism, bioenergetics and biochemical genetics. The structure and function of biological macromolecules involved in these processes is emphasized. Fall and spring. Biological chemistry faculty.

431 [131] MACROMOLECULAR STRUCTURE AND METABOLISM (3). Prerequisites, CHEM 430 and BIOL 202. Structure of DNA and methods in biotechnology; DNA replication and repair; RNA structure, synthesis, localization and transcriptional reputation; protein structure/function, biosynthesis, modification, localization and degradation. Spring. Biological chemistry faculty.

432 [132] METABOLIC CHEMISTRY AND CELLULAR REGULATORY NETWORKS (3). Prerequisite, CHEM 430. Biological membranes, membrane protein structure, transport phenomena; metabolic pathways, reaction themes, regulatory networks; metabolic transformations with carbohydrates, lipids, amino acids, and nucleotides; regulatory networks, signal transduction. Fall. Biological chemistry faculty.

433 [133] TRANSPORT IN BIOLOGICAL SYSTEMS (1). Prerequisites, CHEM 430, MATH 383, and permission of the instructor. Diffusion, sedimentation, electrophoresis, flow. Basic principles, theoretical methods, experimental techniques, role in biological function, current topics. Spring. Biological chemistry faculty.

434 [134] BIOCHEMICAL KINETICS (1). Prerequisites, CHEM 430, MATH 383 and permission of the instructor. Kinetics of biochemical interactions. Basic principles, theoretical methods, experimental techniques, current topics. Fall. Biological chemistry faculty.

435 [135] PROTEIN BIOSYNTHESIS AND ITS REGULATION (1). Prerequisite, CHEM 430. Pre- or corequisites, CHEM 431 and permission of the instructor. Protein biosynthesis mechanism in prokaryotes and eukaryotes; emphasis on structures of the macromolecular machinery; translational regulation mechanisms including autogenous regulation, metabolic and developmental signals; viral control of host protein synthesis.

436 [136] THE PROTEOME AND INTERACTOME (1). Prerequisites, CHEM 430 and permission of the instructor. Methods for and role of bioinformatics in proteomic analysis; proteomics in the analysis of development, differentiation and disease states; the interactome—definitions, analysis, methods of protein-protein interactions in complex systems. Fall (first five weeks). Biological chemistry faculty.

437 [137] DNA PROCESSES (2). Prerequisites, CHEM 431, 480 or 481, and permission of the instructor. Elucidation of the mechanisms of these processes in prokaryotes and eukaryotes from experiments. Experimental results ranging from in vivo studies to structural studies to kinetics. Spring. Biological chemistry faculty.

438 [138] MACROMOLECULAR STRUCTURE AND HUMAN DISEASE (1). Prerequisites, CHEM 431 and permission of the instructor. Impact of protein and macromolecular structure on the development and treatment of human disease, with emphasis on recent results. Examination of relevant diseases, current treatments, and opportunities for improved therapies. Fall. Biological chemistry faculty.

439 [139] RNA PROCESSING (2). Prerequisites, CHEM 431 and permission of the instructor. RNA processing, structure and therapeutics; in-depth exploration of examples from the contemporary literature. Topics include RNA world hypothesis, RNA structure and catalysis, and nucleic acid-based sensors and drug design. Spring (last ten weeks). Biological chemistry faculty.

441 [141] INTERMEDIATE ANALYTICAL CHEMISTRY (2). Prerequisites, CHEM 241 (or 241H), 241L (or 245L and 262 or 262H), and 480 (or 481). Spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis, signal processing. Spring. Analytical chemistry faculty.

441L [141L] INTERMEDIATE ANALYTICAL CHEMISTRY LABORATORY (2). Corequisite, CHEM 441. Experiments in spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis, and signal processing. One four-hour laboratory a week and one one-hour lecture. Spring. Analytical chemistry faculty and staff. (Fee required).

442 [142] CHEMICAL INSTRUMENTATION (2). Prerequisite, CHEM 480 or 482. Corequisites, CHEM 442L and permission of the instructor. Introduction to chemical instrumentation including digital and analog electronics, computers, interfacing and chemometric techniques. Two one-hour lectures a week. Fall. Analytical chemistry faculty.

442L [142L] LABORATORY IN CHEMICAL INSTRUMENTATION (2). Prerequisite, CHEM 480 or 482. Corequisite, CHEM 442. Experiments in digital and analog instrumentation, computers, interfacing and chemometrics, with applications to chemical instrumentation. One four-hour laboratory a week. Fall. Analytical chemistry faculty.

444 [144] SEPARATIONS (3). Prerequisites, CHEM 441 and 480, or 481. Theory and applications of equilibrium and nonequilibrium separation techniques. Extraction, countercurrent distribution, gas chromatography, column and plane chromatographic techniques, electrophoresis, ultra-centrifugation, and other separation methods. Fall or spring. Analytical chemistry faculty.

445 [145] ELECTROANALYTICAL CHEMISTRY (3). Prerequisite, CHEM 480 or 481. Basic principles of electrochemical reactions, electroanalytical voltammetry as applied to analysis and the chemistry of heterogeneous electron transfers, and electrochemical instrumentation. Fall or spring. Analytical chemistry faculty.

446 [146] ANALYTICAL SPECTROSCOPY (3). Prerequisites, CHEM 441 and 482. Optical spectroscopic techniques for chemical analysis including conventional and laser-based methods. Absorption, fluorescence, scattering and nonlinear spectroscopies, instrumentation and signal processing. Fall or spring. Analytical chemistry faculty.

447 [147] BIOANALYTICAL CHEMISTRY (3). Prerequisite, CHEM 441. Principles and applications of biospecific binding as a tool for performing selective chemical analysis. Fall or spring. Analytical chemistry faculty.

448 [148] MASS SPECTROMETRY (3). Prerequisite, CHEM 480 or 481. Fundamental theory of gaseous ion chemistry, instrumentation, combination with separation techniques, spectral interpretation for organic compounds, applications to biological and environmental chemistry. Fall or spring. Chemistry faculty.

449 [149] MICROFABRICATED CHEMICAL MEASUREMENT SYSTEMS (3). Prerequisite, CHEM 441. Introduction to micro and nanofabrication techniques, fluid and molecular transport at the micrometer to nanometer length scales, applications of microtechnology to chemical and biochemical measurements.

450 [150] INTERMEDIATE INORGANIC CHEMISTRY (3). Prerequisite, CHEM 251. Introduction to symmetry and group theory; bonding, electronic spectra, and reaction mechanisms of coordination complexes; organometallic complexes, reactions, and catalysis; bioinorganic chemistry. Fall. Inorganic chemistry faculty.

451 [151] THEORETICAL INORGANIC CHEMISTRY (1–21). Prerequisites, CHEM 251 and 262 or 262H. Chemical applications of symmetry and group theory, crystal field theory, molecular orbital theory. The first third of the course, corresponding to one credit hour, covers point symmetry, group theoretical foundations and character tables. Fall. Inorganic chemistry faculty.

452 [152] ELECTRONIC STRUCTURE OF TRANSITION METAL COMPLEXES (3). Prerequisite, CHEM 451. A detailed discussion of ligand field theory and the techniques that rely on the theoretical development of ligand field theory, including electronic spectroscopy, electron paramagnetic resonance spectroscopy, and magnetism. Spring. Inorganic chemistry faculty.

453 [153] PHYSICAL METHODS IN INORGANIC CHEMISTRY (3). Prerequisite, CHEM 451. Introduction to the physical techniques used for the characterization and study of inorganic compounds. Topics typically include nuclear magnetic resonance spectroscopy, vibrational spectroscopy, diffraction, Mossbauer spectroscopy, x-ray photoelectron spectroscopy, and inorganic electrochemistry. Spring. Inorganic chemistry faculty.

460 [160] INTERMEDIATE ORGANIC CHEMISTRY (3). Prerequisite, CHEM 262 or 262H. Modern topics in organic chemistry. Fall. Organic chemistry faculty.

465 [175] MECHANISMS OF ORGANIC AND INORGANIC REACTIONS (4). Prerequisite, CHEM 450. Kinetics and thermodynamics, free energy relationships, isotope effects, acidity and basicity, kinetics and mechanisms of substitution reactions, one- and two-electron transfer processes, principles and applications of photochemistry, organometallic reaction mechanisms. Fall. Inorganic and organic chemistry faculty.

466 [166] ADVANCED ORGANIC CHEMISTRY I (3). Prerequisite, CHEM 262 or 262H; pre- or corequisites, CHEM 450 and 481. A survey of fundamental organic reactions including substitutions, additions, elimination, and rearrangements; static and dynamic stereochemistry; conformational analysis; molecular orbital concepts and orbital symmetry. Fall. Organic chemistry faculty.

467 [167] ADVANCED ORGANIC CHEMISTRY II (2). Prerequisite, CHEM 466. Spectroscopic methods of analysis with emphasis on elucidation of the structure of organic molecules: 1H and 13C NMR, infrared, ultraviolet, ORD-CD, mass and photoelectron spectroscopy. CHEM 446 and 467 may not both be taken for academic credit. Spring. Organic chemistry faculty.

468 [168] SYNTHETIC ASPECTS OF ORGANIC CHEMISTRY (3). Prerequisite, CHEM 466. Modern synthetic methods and their application to the synthesis of complicated molecules. Spring. Organic chemistry faculty.

470 [190] FUNDAMENTALS OF MTSC (APPL 470) (3). Prerequisite, CHEM 482; or prerequisite, PHYS 128 and pre- or corequisite, PHYS 341. Crystal geometry, diffusion in solids, mechanical properties of solids, electrical conduction in solids, thermal properties of materials, phase equilibria. Fall. Irene.

471 [191] MATHEMATICAL TECHNIQUES FOR CHEMISTS (3). Prerequisite, knowledge of differential and integral calculus. Chemical applications of higher mathematics. Fall. Chemistry faculty.

472 [192] CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (APPL 472, MTSC 472, PHYS 472) (3). Prerequisites, CHEM 482 or PHYS 117 and permission of the instructor. A survey of materials' processing and characterization used in fabricating microelectronics devices. Crystal growth, thin film deposition and etching, and microlithography. Spring. Chemistry and physics faculty.

473 [193] CHEMISTRY AND PHYSICS OF SURFACES (APPL 473, MTSC 473) (3). Prerequisite, CHEM 470. The structural and energetic nature of surface states and sites, experimental surface measurements, reactions on surfaces including bonding to surfaces and adsorption, interfaces. Spring. Irene.

480 [180] INTRODUCTION TO BIOPHYSICAL CHEMISTRY (3). Prerequisites, CHEM 261 or 261H, PHYS 105, and MATH 232. Does not carry credit toward graduate work in chemistry or credit toward any track of the B.S. degree in chemistry. Application of thermodynamics to biochemical processes, enzyme kinetics, properties of biopolymers in solution. Fall. Physical chemistry faculty.

481 [181] PHYSICAL CHEMISTRY I (3). Prerequisites, C- or better in CHEM 102 or 102H, PHYS 116; pre- or corequisites, MATH 383 and PHYS 117. Thermodynamics, kinetic theory, chemical kinetics. Fall. Physical chemistry faculty.

481L [181L] PHYSICAL CHEMISTRY LABORATORY I (2). Prerequisite, CHEM 482. Experiments in physical chemistry. One three-hour laboratory and a single one-hour lecture a week. Fall. Physical chemistry faculty and staff.

482 [182] PHYSICAL CHEMISTRY II (3). Prerequisite, CHEM 481. Introduction to quantum mechanics, atomic and molecular structure, spectroscopy, statistical mechanics. Spring. Physical Chemistry faculty.

482L [182L] PHYSICAL CHEMISTRY LABORATORY II (2). Prerequisite, CHEM 482; pre- or corequisite, CHEM 481L. Experiments in physical chemistry. One four-hour laboratory a week. Spring. Physical chemistry faculty and staff.

484 [184] THERMODYNAMICS AND INTRODUCTION TO STATISTICAL THERMODYNAMICS (1–21). Prerequisite, CHEM 482. Thermodynamics, followed by an introduction to the classical and quantum statistical mechanics and their application to simple systems. The section on thermodynamics can be taken separately for one hour credit. Fall. Physical chemistry faculty.

485 [185] CHEMICAL DYNAMICS (3). Prerequisites, CHEM 481 and 482. Experimental and theoretical aspects of atomic and molecular reaction dynamics. Fall or Spring. Physical chemistry faculty.

486 [186] INTRODUCTION TO QUANTUM CHEMISTRY (3). Prerequisites, CHEM 481 and 482. Introduction to the principles of quantum mechanics. Approximation methods, angular momentum, simple atoms and molecules. Fall. Physical chemistry faculty.

487 [187] INTRODUCTION TO MOLECULAR SPECTROSCOPY (3). Prerequisite, CHEM 486. Interaction of radiation with matter; selection rules; rotational, vibrational, and electronic spectra of molecules; laser based spectroscopy and nonlinear optical effects. Fall or Spring. Physical chemistry faculty.

488 [188] QUANTUM CHEMISTRY (3). Prerequisite, CHEM 486. Applications of quantum mechanics to chemistry. Molecular structure, time-dependent perturbation theory, interaction of radiation with matter. Spring. Physical chemistry faculty.

489 [189] STATISTICAL MECHANICS (3). Prerequisite, CHEM 484. Applications of statistical mechanics to chemistry. Ensemble formalism, condensed phases, nonequilibrium processes. Spring. Physical chemistry faculty.

520L [124L] POLYMER CHEMISTRY LABORATORY (APPL 520L) (2). Pre- or corequisite, CHEM 420 or 421. Thermal analysis, solution viscosity, gel permeation chromatography, end group analysis, synthesis, characterization of an unknown polymer. One four-hour laboratory and one one-hour lecture each week. Spring. Physical chemistry faculty.

530L [131L] LABORATORY TECHNIQUES FOR BIOCHEMISTRY (3). Pre- or corequisite, CHEM 430. An introduction to chemical techniques and research procedures of use in the fields of protein and nucleic acid chemistry. Two four-hour laboratories and one one-hour lecture a week. Biological chemistry faculty and staff.

550L [170L] SYNTHETIC CHEMISTRY LABORATORY I (2). Prerequisites, CHEM 241L (or 245L), 251, and 262L (or 263L). A laboratory devoted to synthesis and characterization of inorganic complexes and materials. A four-hour synthesis laboratory, a characterization laboratory outside of the regular laboratory period and a one-hour recitation each week. Fall. Chemistry faculty and staff.

560L [160L] SYNTHETIC ORGANIC LAB (2). Prerequisites, CHEM 241L, 245L, 262L, 263L. An advanced synthesis laboratory focused on topics in organic chemistry. A four-hour synthesis laboratory, a characterization laboratory outside of the regular laboratory period and a one-hour recitation each week. Fall. Chemistry faculty and staff.

Courses for Graduates

721 [221] SEMINAR IN MATERIALS CHEMISTRY (2). Prerequisite, graduate standing. Fall and spring. Polymer/materials chemistry faculty.

731 [231], [232] SEMINAR IN BIOLOGICAL CHEMISTRY (2 each). Prerequisite, graduate standing. Literature survey dealing with topics in protein chemistry and nucleic acid chemistry. Fall and spring. Biological chemistry faculty.

733 [233] SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY (0.5–21). Modern topics in biological chemistry. Fall and spring. Biological chemistry faculty.

734 [234] SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY: NMR (1–2). Introduction to practical solution NMR of proteins in solution. Fall and spring. Pielak.

735 [235] SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY: MACROMOLECULAR INTERACTIONS (1). Fall and spring. Pielak.

736 [236] MACROMOLECULAR CRYSTALLOGRAPHIC METHODS (2). Data collection, phase determination, and structural refinement. Laboratory component allows students to crystallize protein, collect and process data, determine phases, and refine their structures. Spring. Redinbo.

741 [242], [243] LITERATURE SEMINAR IN ANALYTICAL CHEMISTRY (2 each). 242 given in fall; 243 given in spring. Analytical chemistry faculty.

744 [244], [245] SPECIAL TOPICS IN ANALYTICAL CHEMISTRY (0.5–21). Modern topics in analytical chemistry, including advanced electroanalytical chemistry, advanced mass spectrometry, chemical instrumentation, and other subjects of recent significance. Two lecture hours a week. Fall and spring. Analytical chemistry faculty.

752 [252] SPECIAL TOPICS IN INORGANIC CHEMISTRY (0.5–21). Prerequisite, permission of the instructor. Research-level survey of topics in inorganic chemistry and related areas. Fall and spring. Inorganic chemistry faculty.

754 [254] LITERATURE SEMINAR IN INORGANIC CHEMISTRY (2). Prerequisite, graduate status. Fall and spring. Inorganic chemistry faculty.

758 [258] X-RAY STRUCTURE DETERMINATION (3). Prerequisites, permission of the instructor; a knowledge of elementary and differential calculus is assumed. This course is designed to introduce students to the techniques used in solving crystal structures by X-ray diffraction. Three lecture hours a week. Fall. Inorganic chemistry faculty.

761 [261], [262] SEMINAR IN ORGANIC CHEMISTRY (2 each). Prerequisite, graduate standing. One afternoon meeting a week and individual consultation with the professor in charge. Fall and spring. Organic chemistry faculty.

764 [264], [265] SPECIAL TOPICS IN ORGANIC CHEMISTRY (0.5–21 each). Two lecture hours a week. Fall and spring. Organic chemistry faculty.

767 [267] ORGANIC CHEMISTRY (0.5–21). Prerequisite, to be determined by consultation with professor in charge. Three to six hours a week. Fall and spring. Organic chemistry faculty.

781 [281], [282] SEMINAR IN PHYSICAL CHEMISTRY (2 each). Prerequisite, graduate standing. Two hours a week. Fall and spring. Physical chemistry faculty.

783, 786 [283], [286] SPECIAL TOPICS IN PHYSICAL CHEMISTRY (0.5–21each). Prerequisite, permission of the instructor. Modern topics in physical chemistry, chemical physics, or biophysical chemistry. One to three lecture hours a week. Fall and spring. Physical chemistry faculty.

788 [288], [289] PRINCIPLES OF CHEMICAL PHYSICS (PHYS 827) (3 each). Prerequisite, CHEM 281 or PHYS 321 or permission of the instructor. The quantum mechanics of molecules and their aggregates. Atomic orbitals, Hartee-Fock methods for atoms and molecules.

Research Courses

921 [321] RESEARCH METHODOLOGY AND SEMINAR IN POLYMER/MATERIALS CHEMISTRY (1–21). Seminar and directed study on research methods of polymer/materials chemistry. This course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Polymer/materials chemistry faculty.

931 [331] RESEARCH METHODOLOGY AND SEMINAR IN BIOLOGICAL CHEMISTRY (1–21). Seminar and directed study on research methods of biological chemistry. This course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Biological chemistry faculty.

941 [341] RESEARCH METHODOLOGY AND SEMINAR IN ANALYTICAL CHEMISTRY (1–21). Seminar and directed study on research methods of analytical chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Analytical chemistry faculty.

951 [351] RESEARCH METHODOLOGY AND SEMINAR IN INORGANIC CHEMISTRY (1–21). Seminar and directed study on research methods of inorganic chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Inorganic chemistry faculty.

961 [361] RESEARCH METHODOLOGY AND SEMINAR IN ORGANIC CHEMISTRY (1–21). Seminar and directed study on research methods of organic chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Organic chemistry faculty.

981 [381] RESEARCH METHODOLOGY AND SEMINAR IN PHYSICAL CHEMISTRY (1–21). Seminar and directed study on research methods of physical chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Physical chemistry faculty.

992 [392] MASTER'S (NONTHESIS) (3–6).

993 [393] MASTER'S THESIS (3–6). Prerequisite, 921, 931, 941, 951, 961 or 981. Fall and spring. Graduate faculty.

994 [394] DOCTORAL DISSERTATION (3–9). Prerequisite, CHEM 921, 931, 941, 951, 961 or 981. Fall and spring. Graduate faculty

Department of City and Regional Planning

www.planning.unc.edu
EMIL MALIZIA, *Chair*

Professors

Richard N. L. Andrews (37) Environmental Policy (Joint Appointment with Public Policy)
Philip R. Berke (52) Environmental Planning, Land Use Policy, Natural Hazards Mitigation
Emil E. Malizia (12) Economic and Real Estate Development, Development Finance
David H. Moreau (10) Environmental Planning, Water Resources Planning, Systems Analysis
Roberto Quercia (57) Housing Finance, Housing Policy
William M. Rohe (22) Social Behavioral Aspects of Urban Development, Neighborhood Planning and Development
Dale Whittington (29) Environmental Planning, Public Investment Theory, International Planning

Associate Professors

Daniel Rodriguez (60) Transportation, Spatial Structure
Meenu Tewari (59) Microeconomics, International Planning

Assistant Professors

Todd Bendor (65) Economic Development, Urban Spatial Structure
Thomas Campanella (61) Urban Design Theory and Practice, History of the American Built Environment, Site Planning
Nichola Lowe (63) Economic Development
Noreen McDonald (66) Transportation Planning
Mai Nguyen (64) Housing and Community Development
Yan Song (62) Geographic Information Systems, Urban Spatial Analysis, Land Use and Site Planning

Research Professors

Richard E. Bilsborrow, Developing Countries
David J. Brower (34) Growth Management, Coastal Planning, Hazard Mitigation

Adjunct Professors

Richard N. L. Andrews, Environmental Policy Analysis
Edward M. Bergman (14) Economic Development
Harvey Goldstein (36) Planning Theory, Economic Development, Research Methods
Jonathan B. Howes (44) Planning and Government
Asad J. Khattak (54) Transportation, Quantative Analysis
Michael I. Luger (38) Urban and Regional Economics and Development, Public Policy Analysis, Infrastructure and Housing
David Owens (49) Land Use Law
Michael A. Stegman (6) Housing and Policy Development, Real Estate Development (Joint Appointment with the Kenan-Flagler Business School)

Associated Faculty

Brian A. Ciochetti, Real Estate Development
Milton S. Heath Jr., Natural Resource Law
David J. Hartzell, Real Estate Finance
J. Myrick Howard, Historic Preservation
Dennis A. Rondinelli, Developing Countries
Judith W. Wegner, Land Use and Local Government Law

Professors Emeriti

Raymond J. Burby
F. Stuart Chapin Jr.
Maynard M. Hufschmidt
Edward J. Kaiser
David R. Godschalk
Shirley F. Weiss

City and Regional Planning

The state of North Carolina, the Research Triangle region and the community of Chapel Hill are ideally suited to serve as the home base of a nationally ranked program in city and regional planning. The UNC-Chapel Hill campus is 30 miles west of Raleigh, the state capital and the location of many agencies of state government. Through research projects, internships and workshop courses, faculty and students interact with agencies such as Commerce, Community Development, Labor, Environmental and Natural Resources, Transportation, the Board of Science and Technology and the North Carolina Housing Finance Agency.

The 5,600-acre Research Triangle Park, which boasts over 40 large research facilities employing more than 30,000 people, is only 10 miles from campus. The park, which symbolizes the style of high-tech economic development emerging in many growing regions in the United States, is one of the primary engines driving the area's growth. The Raleigh/Durham metropolitan area, of which Research Triangle Park and Chapel Hill are part, has been identified as one of 30 metropolitan areas in the country that accounted for half of the new jobs in the nation. North Carolina, the nation's 10th most populous state, is growing by about 1.5 percent a year. The Research Triangle area is growing three times as fast. The future urbanization patterns of other areas are evident in the Research Triangle area.

The Department of City and Regional Planning (DCRP) at the University of North Carolina at Chapel Hill was established in 1946. It was among the first seven planning education programs in the United States. The original bases of the department and its program were ideas about regionalism, broad-scale development planning and the application of social science methods to practical problems of government being explored on the Chapel Hill campus in the 1930s and 1940s. This was the first planning department to be established with its principal university base in the social sciences, rather than in landscape design, architecture or engineering. The department has retained and strengthened that social science legacy through its faculty's multidisciplinary research and teaching programs.

At the start of the program in 1946, planning was defined as "the union of modern social science, design and engineering. It utilizes social science techniques to analyze the adjustments between people and their physical environment, and adjustments among people in their efforts to meet human needs. Through the planning process, ways and means of meeting these needs are developed through social organization and the application of design and engineering techniques."

From an original concern for applications of social science to regional development needs, the department has broadened its scope to include urban, state and community planning and to cover physical, social, economic and natural environmental concerns. The implementation and management aspects of planning—carrying out public policy through programs, projects, budgeting and finance, regulatory controls and other actions—are also emphasized.

The concept of development as a goal of planning remains central to the department's mission. Whether the objectives are improved physical, social, economic or environmental conditions or more efficient and equitable policies and programs, planning is a way to effectively marshal resources to achieve public development objectives. The professional planner combines an understanding of urban and regional theory grounded in a spatial context with a grasp of the planning and management methods necessary to guide development toward desired goals. These skills have taken on added importance with the emergence of expanded state and local responsibilities and increased public-private development ventures.

Graduates of the program apply their professional knowledge as local and regional planners, private consultants, public interest group staff members, nonprofit development organization planners, and state and federal government officials. To be an effective professional in these varying contexts requires a continuously updated knowledge base; therefore, the practitioner must be supported by active researchers. Thus, the overall mission of the department is twofold: to educate practitioners and researchers capable of leadership in planning and to expand the frontiers of knowledge about the effects of public and private actions on development processes through faculty research and service.

Degrees Offered

The department offers two degrees: the master of city and regional planning (M.C.R.P.) and the doctor of philosophy (Ph.D.) in planning. The two-year master's degree program prepares students for the professional practice of planning. The Ph.D. program prepares students for careers in research and university teaching in planning. The requirements of the two programs are described in detail in subsequent sections of the catalog. The two graduate degree programs are largely independent. Applicants should indicate which program they wish to enter.

Facilities and Equipment

The Department of City and Regional Planning is housed in New East. New East contains microcomputer laboratories, lecture and seminar rooms, offices, and the F. Stuart Chapin Jr. Research Library, which contains books, periodicals, pamphlets, reports and maps used in the study of planning.

The Chapin Library, with some 16,000 books, 2,000 bound volumes and 6,500 planning reports and documents, is one of the outstanding planning research collections in the country. The facilities and services of all University libraries and those of other Triangle universities are available to students enrolled in the Department of City and Regional Planning.

Mainframe and additional microcomputer facilities and a geographic information systems laboratory are available to students through the Odum Institute for Research in Social Science and through the UNC-Chapel Hill Computation Center.

Students in the Department

During the past 60 years students have entered the department from all parts of the United States, Canada and many other countries. The educational backgrounds of alumni who now hold positions of responsibility in the profession cover a wide range of undergraduate fields. Among them are architecture, biology, botany, business, economics, engineering, forestry, geography, history, landscape architecture, philosophy, political science, public policy analysis, psychology, public administration, sociology and urban studies.

Graduates hold positions as directors of planning in the planning departments of small and large cities and as directors of state and regional planning programs. Graduates work as associate and assistant planners in city, county, metropolitan and regional planning agencies; in housing and urban development agencies; in various branches of the federal service; in community-based organizations and associations; in research organizations; and in private development firms and banks. Finally, graduates are also employed as private consultants; as planning advisors to communities and developing areas; and as deans, chairs and faculty members of educational institutions.

The Planning Profession and Employment Opportunities

During the past 30 years the field of planning has expanded considerably. The planning function remains a central part of municipal, county and state government. Planning agencies operate within the framework of metropolitan, regional and national governmental programs. Planning expertise is now essential in nonprofit and community-based development organizations, consulting firms, advocacy groups and other private organizations.

This period of increasing planning activity has broadened the scope of planning. In addition to design, research and analysis, present-day planning functions include program management and implementation activities within public agencies and private organizations, as well as coordination between government and business. Planners are increasingly called upon to lead analysis teams, to mediate conflicts, to advise decision makers of project impacts and to package development proposals.

Employment opportunities in planning are varied. In general the work involves collection and processing of data; physical, environmental and socioeconomic analysis; the preparation and evaluation of alternative proposals; and the formulation and implementation of programs for action.

As a consequence of the growth of planning activities throughout the

world, adequately trained and qualified members of the profession are in demand in this country and abroad.

Equally important to the advancement of the field is the increasing need for advancing theory and knowledge in urban and regional development and for motivated teachers of planning. There has been a steadily increasing demand for teachers and researchers among universities and research organizations in the United States, Canada and overseas.

Together with the faculty, hundreds of the department's 1,800 alumni in all parts of the country form an effective job referral and placement network for new and old graduates alike. Large numbers of our graduates in such key metropolitan centers as Boston, New York, the District of Columbia, Atlanta, Miami, Chicago and on the West Coast provide invaluable assistance to students in their initial job searches and throughout their professional careers. Alumni keep in touch with the department and each other through the Alumni Listserv and the Alumni Newsletter, which the department publishes and distributes annually to all graduates.

Application and Admission

Applications for the fall semester must be received by January 1 to be considered for fellowships offered by The Graduate School and to ensure first consideration for departmental fellowships, assistantships and other financial aid. Applicants are notified of admission on a continuous basis between late January and early May. Financial aid decisions are made by early April, and the admissions process is fully completed by mid-May.

Forms and instructions for application are available on the Web (www.planning.unc.edu/program/admiss.htm) or by mail from the department upon request. Each applicant is required to pay a nonrefundable $73 fee when submitting an application.

Applicants are advised to apply for admission as early as possible. Open-house weekend, hosted by the department each March, provides applicants an opportunity to learn about the department and discuss their professional interests with faculty and enrolled students. Applicants may also visit the department on specific dates. For more admissions information see the departmental Web site at www.planning.unc.edu/program/admiss.htm.

Admission Requirements

All prospective students must hold a bachelor's degree from an accredited college or university. The educational backgrounds of applicants cover a wide variety of academic fields, work experiences, ethnic backgrounds and geographic locations. Among them are architecture, biology, business, economics, engineering, biology, geography, geology, history, landscape architecture, philosophy, planning, political science, psychology, public administration, sociology and urban studies.

Applicants are required to take the Graduate Record Examination (GRE). The GRE should be taken as early as possible. It is administered in conveniently located centers throughout the United States and in many other countries. Appointments are scheduled on a first-come, first-served basis. Register early to get your preferred test date, and to receive your test preparation material in time to prepare for the test. Applicants may register by phone, mail or fax. Information on the GRE is available from the admission offices of most colleges and universities, or by writing to Graduate Record Examinations, CN 6000, Princeton, N.J. 08541-6000, or from their Web site, www.ets.org. GRE scores are recognized as contributory, not determinative, evidence of the applicant's qualifications.

Admission Decisions

The Graduate School makes admissions decisions on the basis of recommendations submitted by the department. In making admissions recommendations, a student committee reviews all applicants in terms of established department policy. The department considers all credentials submitted as part of the application. No single factor is regarded as qualifying or disqualifying. Factors considered in the review of all applications include the grades and academic transcript, GRE scores, references, strength of courses, undergraduate institution, professional work experience, and statement of interest. The statement of interest should demonstrate understanding of and commitment to the planning field. The student's overall academic record should be strong.

The department has a strong commitment to increasing diversity and providing opportunities for disadvantaged persons to enter the planning profession. We admit students from a variety of academic fields, work experiences, ethnic backgrounds and geographic locations. Most successful applicants have planning-related work experience.

Transfer Credit

Students desiring to transfer to UNC-Chapel Hill from another graduate planning program may do so if they meet the admission requirements. Courses submitted for transfer must be reviewed and approved by this faculty. The maximum credit that may be transferred from another program is nine semester hours for the master's degree.

Similarly, students wishing to transfer nonplanning graduate course work taken elsewhere may do so up to a maximum of nine semester credit hours, provided that the courses were not credited to another degree and that the courses are judged by the department to be appropriate to the elective requirements of the student's program at UNC-Chapel Hill. Graduate courses taken as an undergraduate are not transferable.

A minimum of three semesters in residence is required.

The Professional Master's Degree Program

The program leading to the degree of master of regional planning prepares the candidate for professional planning practice. The curriculum covers social and institutional problems and settings and planning and management skills.

Satisfactory completion of the degree requires completion of a minimum of 51 credit hours, including an area of specialization and a master's project in that area. The normal course load is 12 to 15 credit hours per semester. Thirty-nine of the required 51 credits must be taken in the City and Regional Planning Department.

Course work for the degree is divided into general requirements, area of specialization and electives. Each student is assisted by a faculty advisor in designing an educational program. The advisor helps select courses appropriate for the student's educational interests and goals.

General Course Requirements

All master's degree students are expected to meet certain general course requirements. These consist of courses covering planning theory, urban spatial theory, applied microeconomics, analytical methods, communications skills and a planning workshop. These basic course topics constitute a core of knowledge and skills prerequisite to completion of the master's degree program.

The planning theory requirement is met by completing PLAN 704. The analytical methods requirement is met by completing PLAN 720. PLAN 714 fulfills the spatial theory requirement. The economics

requirement is met by completing PLAN 710. Students select a planning workshop (PLAN 823) during their second year. In addition, most students take a planning law course appropriate for their specialization.

Areas of Specialization

Each student develops an area of specialization in Planning in consultation with faculty advisers. The area of specialization identifies the fields of professional practice in which the student expects to develop competence and begin a professional career.

Areas of specialization offered by the department reflect a combination of current practice, employment opportunities, available faculty resources, and longer term societal needs. As these factors change, specialization content is adjusted. Specialization offers different blends of technical knowledge, planning and management skills, philosophies about the role of the planner, and theories for understanding relevant problems and contexts.

The department offers five specializations associated with professional planning practice in community development, design and preservation, economic development, land use and environmental planning, and transportation planning. Sustainable development is the overarching concept for these specializations. Each emphasizes equity, environmental quality, economic viability and social participation and grapples with the interconnections among these dimensions of sustainability.

- **Economic Development** focuses on planning for functional and sustainable regional economies and issues of income and jobs for central city areas.
- **Housing, Real Estate and Community Development** is concerned with the supply of affordable housing, the revitalization of urban neighborhoods, project development and central city redevelopment.
- **Land Use and Environmental Planning** addresses growth management at the urban and regional scales, environmental management and policy analysis with emphasis on water resources.
- **Design and Preservation of the Built Environment** combines course work in urban history, urban design and historic preservation. (emphasizing small-area planning).
- **Transportation Planning** provides concepts and tools relevant to transportation policy and planning and in-depth knowledge of the reciprocal relationship between transportation decisions and land development.

Students with a special interest in areas of the developing world may take a formal minor in planning for developing areas, in addition to their area of specialization. The minor is designed to train planners from both industrialized and less developed countries to work on management, research, administrative and planning issues at the local, regional and national levels in developing areas. Theories of economic development, social change, environmental degradation and urbanization are presented, as well as analytical tools and quantitative techniques that prepare students to embark on a variety of careers that meet the needs of donor agencies and governments in developing countries. Students receive training in cost-benefit analysis and project appraisal, project management and population planning.

It is also possible for master's students in City and Regional Planning to take a formal minor in public policy analysis within the structure of the M.C.R.P. curriculum.

Generally, specialization courses account for 15 credit hours. Thus, in the 51 credit-hour program, about two-thirds of the credits fulfill basic requirements or specialization requirements, while the rest are electives chosen by the student in consultation with faculty advisors.

General Electives

Additional courses are required beyond the general required courses and courses in the area of specialization. General electives may be used to 1) complement and support the area of specialization, 2) specialize in another area of professional planning, 3) develop skills in a discipline (e.g., economics, design, management) or another professional program represented on campus (e.g., public administration, health administration, environmental engineering or business) or 4) develop general competence for professional practice through courses selected both within the department and from the regular offerings of the University. Up to 12 credits may be taken outside the department.

Summary of Course Requirements

	Total	Must Be In DCRP	May Be Outside of DCRP
Planning Theory	3	3	–
Urban Spatial Structure	3	3	–
Planning Law	3	3	–
Economic Theory	3	3	–
Planning Methods	3	3	–
Problem Solving Workshop	3	3	–
Area of Specialization	15	12–15	0–3
Electives/Supporting Courses	18	6–9	9–12
Master›s Project	3	3	–
Total	**51**	**39**	**12**

Master's Project

The master's project required of all master's degree students is original work involving substantial independent research and analysis of a topic related to planning practice. The requirement may be met by a paper of standard format. The requirement can also be fulfilled with a product in some other form, such as a plan or audiovisual presentation. Ordinarily students submit an individually prepared paper. The student submits the paper topic and outline to the director of the student's focus area. The director approves the topic and assigns a faculty member to serve as major advisor for the project. The student may invite another faculty member to serve as a reader. Both must approve the final project. The project is completed during the final semester in residence and is filed by the department as part of the permanent record of the student's work.

The Doctoral Program

The doctoral program in planning provides training in research methods, planning theory and areas of specialization that enable graduates to contribute to the development of substantive theory, knowledge and scholarship in planning; to formulate and evaluate innovative public policy; and to administer research programs in domestic and international contexts. The program is small but highly selective and individualized. It is ideal for mature students from a variety of backgrounds.

The Ph.D. degree requires a minimum of 30 credits. A master's degree in planning is not required, although most doctoral students have previous graduate work in planning or a related field. Students must fulfill four semesters of residence. The department accepts graduate transfer credits but requires at least one year of continuous residency of at least six semester hours per regular semester. The department does not require a foreign language. It strongly encourages both research and teaching experience during residency.

In practice, doctoral candidates who hold master's degrees in plan-

ning or a related field generally require three to four semesters of formal course work in residence before beginning the dissertation. Other candidates may require five or more semesters, depending on their preparation. Dissertation research generally takes an additional year.

Each student develops an individualized course of study to reflect a specific area of interest and career aspirations. Areas of specialization and appropriate course work are determined jointly by the student and program advisor. Programs are designed to meet the student's needs and build on prior academic training, for which substantial departmental or University faculty resources are available. Courses in the area of specialization must be mutually reinforcing and coherent; must prepare the student for expertise in some body of knowledge, methodology, or problem area; and must provide the student with the methods and knowledge base to do scholarly research. The comprehensive exams, taken at the end of course work, require a knowledge of planning theory and research methods (in addition to the student's specific area of specialization).

A student may take a formal minor in another discipline with the consultation and approval of the appropriate department and the student's program committee. The minor emphasizes the achievement of methodological and related skills necessary to extend the student's research capabilities within a chosen area of specialization. Supportive complementary relationships between the two program components must be demonstrated.

It is important that the Ph.D. Admissions Committee be able to identify an applicant's program interests from application materials submitted for review to The Graduate School and to the department. In addition to any supplemental material the applicant may wish to submit in support of the application, the statement called for in the department's supplemental application should describe the proposed area of concentration and specific program course work and research interests, and provide information on relevant prior academic and professional training. The admissions process consists of two related phases. First, the Admissions Committee renders judgment about the academic qualifications of the Ph.D. applicant. Second, if academic qualifications are met, the committee attempts to identify the applicant's program interests and the stage of development of those interests, and then considers the extent to which departmental and University-wide resources may be marshaled in support of those stated interests. Thus, academic qualifications are necessary but are not the only basis for admission into the doctoral program. Applicant interests must be clear and University resources must be supportive to ensure the development of a strong Ph.D. program.

Persons wishing to be considered for admission to the doctoral program and for fellowships and assistantships that may be available to doctoral candidates are advised to communicate with the department as far in advance as possible of the date they wish to enter. While the University financial awards are made in the spring semester each year, the deadline for applications for certain fellowships available to Ph.D. candidates is in January of the year preceding the August in which the applicant plans to begin the doctoral program. Applicants benefit by a visit to the department to discuss program requirements and interests prior to making formal application for admission.

Dual Degree Programs

Program in Law and Planning

Under a dual-degree program sponsored by the School of Law and the Department of City and Regional Planning, students may pursue the J.D. and M.C.R.P. degrees together. Taken concurrently, the two degrees may be obtained in four years rather than the five years ordinarily required. The program seeks to develop professionals capable of dealing with both the legal and planning aspects of urban and regional development and policy. Course work is designed to prepare students for a variety of professional roles in which knowledge of planning methodology and process, coupled with the analytical skills and professional expertise of the lawyer, are essential. Graduates join private law firms, consulting firms and public legal and planning staffs.

To enter this program, students must apply separately to the School of Law and to the Department of City and Regional Planning, and must be accepted independently by both. Students entering the program spend their entire first year in either the planning department or the law school, and students must make this choice at the time of admission. The second year is normally spent full-time in the program not selected in the first year. After the first two years, the student has an additional 43 semester credits to complete in the law school and 12 semester credits to complete in planning.

To request an admission packet for the law school, please contact:
Admissions Office
School of Law
Campus Box 3380
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-3380

Program in Business and Planning

The Kenan-Flagler Business School and the Department of City and Regional Planning offer a dual-degree program leading to the M.B.A. and M.C.R.P. degrees, usually in three years. The program builds management and planning skills that enable graduates to pursue rewarding, flexible, and socially useful careers in the private, nonprofit or public sectors. Graduates work in real estate and economic development consulting, financial institutions and entrepreneurial firms. Increasingly, applicants to the business and planning program want to pursue career paths that combine planning and management and seek the flexibility to move between jobs in the public and private sectors.

To enter this program, students must apply separately to both the Department of City and Regional Planning and the Kenan-Flagler Business School, and must be accepted independently by both. Students entering the program spend their entire first year in either the planning department or the business school. The second year is spent full-time in the other program. In the third year, students take courses in both business and planning. Sufficient electives can be taken in planning and business so that a curriculum can be tailored to each student's career objectives. Admission to the business school is based on demonstrated potential for responsible leadership, the quality of the student's academic transcripts and the applicant's score on the Graduate Management Admission Test (GMAT), administered by the Educational Testing Service of Princeton, N.J.

To request an admission packet for the Kenan-Flagler Business School, please contact:
Director of M.B.A. Admissions
The Kenan-Flagler Business School
Campus Box 3490, McColl Building
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-3490
Web: www.kenanflagler.unc.edu

Program in Public Administration and Planning

Planners often gravitate to management positions in local and state government that require knowledge of budgeting, personnel and government administration and politics. City and county managers grapple with planning and development issues, which constitute a large portion of local government agendas. This dual-degree program prepares professionals who want the flexibility of moving between planning and management positions in government. The department and the Public Administration program in the School of Government collaborate to enable students to receive both the M.C.R.P. and the M.P.A. degrees in three years, plus a summer professional field experience in public administration.

The intent of the combined program is to ensure that students have two complete and complementary, but distinct, areas of training. The M.P.A. requirements ensure adequate training in public management. The M.C.R.P. requirements ensure adequate training in core planning knowledge and skills, and in an area of planning specialization.

Students must obtain admission to both the M.P.A. and M.C.R.P. programs independently. With prior approval from faculty advisors in both programs, students may then count certain courses toward both degrees. The combined program requires a total of 75 semester credit hours. Students are advised to gain approval from faculty advisors for their specific program of courses during the first semester of residence to ensure that they can meet all requirements of both programs within three years.

To request an admission packet for the Master of Public Administration program, please contact:

Sharon Pickard
M.P.A. Program Manager
Master of Public Administration Program
School of Government
CB # 3330 Knapp-Sanders Building
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-3330
Phone: (919) 962-0425 Fax: (919) 962-8271
E-mail: mpastaff@iogmail.iog.unc.edu
Web: www.mpa.unc.edu

Program in Public Health and Planning

The intellectual, professional and historical connections between public health and city planning have assumed new urgency in the 21st century, as the challenges of chronic illness, urban livability and public safety have come to the fore. The built environment is increasingly seen as an important factor influencing physical activity, which in turn has positive impacts on health promotion and disease prevention. The growth and redevelopment of urban areas impact public health and safety in many ways. It is important to reconnect the public health and urban planning fields through professional training that will encourage greater connections in professional practice.

The Department of City and Regional Planning and the School of Public Health have three dual degree programs to facilitate the reconnection of the professions. Dual programs exist with the Department of Health Behavior and Health Education (HBHE), Environmental Sciences and Engineering (ESE) and Health Policy and Administration (HPAA). To enter these programs, students must apply separately to the Department of City and Regional Planning and the departments in the School of Public Health, and must be accepted independently by both. Students entering the program spend their entire first year either in SPH or DCRP. The second year is spent full-time in the other program. In the third year, students take both public health and planning courses. Students should be able to complete both programs in three years (instead of four years). Students are expected to complete master's projects or other capstone requirements for each department at the end of the program that demonstrate mastery of the two fields and an understanding of the interconnections between the fields.

The Department of City and Regional Planning offers the Master of City and Regional Planning degree (M.C.R.P.).

The departments in the SPH offer the following degrees:

HBHE: Master of Public Health (M.P.H.)
ESE: Master of Public Health (M.P.H.), Master of Science (M.S.), Master of Science in Environmental Engineering (M.S.E.E.), and Master of Science in Public Health (M.S.P.H.).
HPAA: Master of Public Health (M.P.H.), Master of Science in Public Health (M.S.P.H.) and Master of Healthcare Administration (M.H.A.).

To request an admission packet for the School of Public Health, please contact:

Linda Cook, Registrar
Department of Health Behavior and Health Education
CB# 7440, Rosenau Hall
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-7440
Phone: (919) 966-5771 Fax: (919) 966-2921
E-mail: lwcook@email.unc.edu
Web: www.sph.unc.edu/hbhe

Program in Landscape Architecture and Planning

The dual-degree program in landscape architecture and planning strengthens the design dimension of the planning curriculum, and creates a venue for working closely with the College of Design at North Carolina State University. The Department of Landscape Architecture offers two graduate program tracks leading to the Master of Landscape Architecture (M.L.A.), both of which emphasize creative problem solving and a long-term commitment to responsible design. The curriculum provides the professional skills needed to deal with the human and natural forces that shape the land. The department is especially concerned with the protection, restoration, enhancement and regeneration of the natural and cultural environments in urban, rural and wilderness settings.

To enter this program, students apply to each department separately and must gain admission to both. The amount of time required for the M.L.A. will depend on whether the student is pursuing the First Professional Degree track (82 credits) or Advanced Studies track (42 credits). Usually, students will be able to reduce the time needed to attain both the M.C.R.P. and the M.L.A. by about one year by taking course work in each department that counts toward the other department's degree program.

To request an admission packet for the Department of Landscape Architecture, please contact:

Pam Christie-Tabron
Department of Landscape Architecture
220 Brooks Hall, Box 7701
College of Design
North Carolina State University
Raleigh, N.C. 27695-7701
Phone: (919) 515-8308
E-mail: pamela_christie@ncsu.edu
Web: ncsudesign.org/content

Program in Civil Engineering
A dual degree program is under development with the Department of Civil Engineering at North Carolina State University.

Students in Other Departments

Students taking degrees in other departments may be admitted to courses in city and regional planning provided they have the necessary prerequisite training and permission of the instructor. Courses are also open to undergraduate students. Priority is given to students minoring in urban studies and planning.

Research Programs in Urban and Regional Studies

Through the Center for Urban and Regional Studies, the Odum Institute for Research in Social Science, the Water Resources Research Institute, the Institute for Environmental Studies, the Carolina Population Center and the Institute for Economic Development, members of the faculty and graduate students in the Department of City and Regional Planning and in related departments collaborate on research in a wide range of subject areas concerning planning, human behavior and the environment.

Established in 1953 and later expanded under a grant from the Ford Foundation, the program of the Center for Urban and Regional Studies is concerned with theoretical and empirical research in urban processes and area development. The center has a permanent staff for planning and administration of its program and for the development of an interdisciplinary research-oriented program of services to local and state governments in North Carolina and elsewhere. The department's faculty use the center to pursue research interests and collaborate with faculty members of other University departments on research projects.

In 1964 the Water Resources Research Institute was established to support research on all aspects of water resources, including the planning, programming and analysis of urban and regional systems for development and control of quantity and quality of water and related land use. The institute serves as a focal point for faculty and student research and interdisciplinary seminars relating to water resources.

The Carolina Population Center (CPC), established in 1966, provides coordination of the University-wide interdisciplinary program in population research and training. The center provides population research services to faculty doing research in the social, behavioral and health sciences in the United States and abroad. Departmental faculty and students are engaged in international research through the CPC.

The Institute for Economic Development was created in 1971 within the Extension Division of the University to sponsor the Basic Economic Development course. Now under the auspices of the Department of City and Regional Planning, the institute promises to strengthen the department's research and teaching mission and to enlarge its service capacity.

The Highway Safety Research Center (HSRC) is dedicated to improving transportation safety, with a major emphasis on highway safety. The center conducts basic and applied research that increases knowledge and contributes to reducing death, injury and related societal costs. HSRC works to translate developed knowledge into practical interventions that can be applied at local, state, national and international levels. HSRC conducts research in the three major areas of the highway safety problem—the driver/occupant, the vehicle and the roadway. HSRC produces guidebooks, brochures, how-to manuals, news releases, public service announcements and newsletters to communicate highway safety information to research colleagues, safety advocates, government officials and motorists.

In addition to these activities organized under an institute or center, faculty members are engaged in research projects administered by the department.

Several other facilities in the nearby Research Triangle Park enrich and support the department's teaching and research programs:

The Research Triangle Institute (RTI) is a not-for-profit corporation that conducts research under contract to departments of federal, state and local governments; public service agencies; foundations; and industry clients ranging from local firms to national corporations.

RTI was created as a separately operated affiliate of the three major universities that form the Research Triangle. Initial start-up funding for RTI was provided through a grant from the Research Triangle Foundation.

The institute is organized into major groups whose areas of capability span social and economic systems and human resources, statistical sciences, survey research, chemistry and life sciences, energy, engineering and environmental sciences.

The Environmental Research Center of the U.S. Environmental Protection Agency (EPA), the largest field installation of the EPA, was dedicated in December 1971. Today it is an international center of scientific expertise in environmental research.

The Triangle Universities Center for Advanced Studies, Incorporated (TUCASI) represents an additional effort in the Research Triangle to capitalize on the presence in a small radius of three major doctoral-research institutions, their facilities, libraries, and auxiliary resources. TUCASI is a joint activity of the University of North Carolina at Chapel Hill, Duke University in Durham and North Carolina State University in Raleigh. TUCASI is the parent body that sponsors development of advanced study enterprises on its 120-acre campus within the Research Triangle Park. The center, chartered in 1975, is governed by a board of trustees, representing the constituent universities, the Research Triangle Foundation and elected members.

The National Humanities Center (NHC) was the first resident activity on the TUCASI campus. The center opened in 1978 as an institute for advanced study in history, literature, philosophy and other fields of the humanities. Each year, approximately 45 leading scholars from the United States and other nations come to NHC to pursue individual research and engage in interdisciplinary seminars, lectures and conferences. Their work results in books, articles and other contributions to learning. Grants from major foundations, corporations, the National Endowment for the Humanities, the major universities in the Triangle and individuals support the center's program funding and administrative costs.

The UNC Institute for Transportation Research and Education (ITRE) is a division of the University of North Carolina General Administration. Its responsibilities include facilitation of transportation-related programs throughout the 16 UNC system campuses. Affiliated faculty and staff of ITRE are located on various campuses of the University system and at ITRE's Research Triangle Park facilities. Included among ITRE's activities are workshops, short courses, research projects and training programs for transportation professionals throughout North Carolina.

Courses for Graduates and Advanced Undergraduates

499 [110] EXPERIMENTAL COURSE UNDERGRADUATE (1–21). The functioning of the urban area as a complex system. Analysis of planning and policies aimed at development and change. The course is generally taken for three credits. Fall or spring. Faculty.

526 PRINCIPLES OF PUBLIC FINANCE FOR PLANNING AND POLICY (PLCY 526) (1.5). Provides the foundation of state and local govern-

ment finance necessary to understand new developments in the provision of infrastructure for economic development.

527 APPLIED PUBLIC FINANCE FOR INFRASTRUCTURE AND ECONOMIC DEVELOPMENT (PLCY 527) (1.5). Explores the role of infrastructure in economic development, including innovations in finance, management and technology. Covers traditional and knowledge infrastructure. Addresses trade-off between environmental protection and economic growth.

550 EVOLUTION OF THE AMERICAN URBAN LANDSCAPE (3). Examines shaping the urban built environments of the United States from the colonial era to present day. Critically examines forces that shaped our cities, and studies the values, ideals and motivations underlying efforts to plan and direct physical development of American cities.

574 POLITICAL ECONOMY OF POVERTY AND INEQUALITY (3). Introduces students to the political economy of poverty alleviation programs. Uses comparative cases to explore what types of projects, tasks and environments lead to effective and equitable outcomes, and why.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, ENVR 585, PLCY 585) (3). Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, and instruments, policy analysis, and major elements of American environmental policy. Lectures and case studies. Fall. Andrews.

591 APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (GEOG 591) (3). Prerequisite, GEOG 370 or 491, or equivalent. Applied issues in the use of geographic information systems in terrain analysis, medical geography, biophysical analysis and population geography. (GISc)

636 [126] URBAN TRANSPORTATION PLANNING (3). Fundamental characteristics of the urban transportation system as a component of urban structure. Methodologies for the analysis of transportation problems, planning urban transportation and the evaluation of plans. Spring. Khattak.

637 [127] PUBLIC TRANSPORTATION (3). Alternative public urban transportation systems including mass transit, innovative transit services and paratransit, examined from economic, land use, social, technical and policy perspectives.

641 [141] ECOLOGY AND LAND USE PLANNING (3). Integration of the structure, function and change of ecosystems with a land use planning framework. How land use planning accommodates human use and occupancy within ecological limits to sustain long-term natural system integrity. Spring. Rodríguez.

651 [751] URBAN FORM AND THE DESIGN OF CITIES (3). Introduction of fundamental urban design theory and practice. Critically looks at built environment and how architecture defines and delimits physical space. Studies local and historical examples of urban design.

662 [142] GENDER ISSUES IN PLANNING AND DEVELOPMENT (WMST 662) (3). Permission of the instructor required for undergraduates. Examination of the environmental and health risks, policy institutions, processes, instruments, policy analysis and major elements of American environmental policy. Lectures and case studies. Fall. Faculty.

685 [219] WATER AND SANITATION PLANNING AND POLICY IN DEVELOPED COUNTRIES (ENVR 685) (3). Permission of the instructor. Seminar on policy and planning approaches for providing improved community water and sanitation services in developed countries. Topics include the choice of appropriate technology and level of service, pricing, metering and connection charges; cost recovery and targeting subsidies to the poor; water venting; community participation in the management and operation of water systems; and rent-seeking behavior in the provision of water supplies.

686 [186] POLICY INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT (ENST 686, ENVR 686, PLCY 686) (3). Prerequisite, ECON 410 or PLAN 710, or equivalent. Design of public policy instruments as incentives for sustainable management of environmental resources and ecosystems, and comparison of the effects and effectiveness of alternative policies.

691H [099] HONORS SEMINAR IN URBAN AND REGIONAL STUDIES (3). Permission of the instructor. An overview of the subject matter and methods of investigation for the study of cities and regions. Presentations of original papers prepared by students.

697 [270] INTERNATIONAL DEVELOPMENT AND SOCIAL CHANGE (3). Permission of the instructor. Course explores effect of the global economy on national and community development, effect of environmental degradation processes on development, and strategies to guide social change.

701 RESEARCH METHODS (1–6). Course combines material learned in other courses (theory/philosophy, methods and their substantive area of interest). Familiarizes students with the skills necessary to conduct research and critically review and understand evaluation reports.

720 [130] PLANNING METHODS (3). Prerequisite, permission of the instructor required for undergraduates. Accessing information from conventional and electronic sources, spatial data acquisition, analysis and mapping. Inferential statistics through multiple regression. Microcomputer laboratory. Fall. Khattak.

721 [230] ADVANCED PLANNING METHODS (3). Prerequisite, permission of the instructor required for undergraduates. More in-depth treatment of topics covered in PLAN 720. Particular emphasis on techniques of multiple regression analysis, forecasting, categorical data analysis and spatial data analysis. Fall and spring. Faculty.

738 [128] TRANSPORTATION POLICY AND PLANNING (3). Prerequisite, PLAN 636 or permission of the instructor. Examination of active transportation planning and policy questions: land use relationships, modal comparisons, environmental quality, transportation demand management, paratransit planning, the transportation needs of special populations and international comparisons. Fall. Rodríguez.

739 [129] TRANSPORTATION PLANNING MODELS (3). Prerequisite, permission of the instructor required for undergraduates. The transportation planning process; data collection, trip generation, modal choice, trip distribution and assignment. Social, economic and environmental impacts of transportation. Innovative modeling techniques. Spring. Faculty.

Courses for Graduates

491 [246] GIS FOR PLANNERS (3). Stresses the spatial analysis and modeling of organizing data within a geographic information system. Spring. Faculty.

526 PRINCIPLES OF PUBLIC FINANCE FOR PLANNING AND POLICY (PLCY 526) (1.5). Provides the foundation of state and local government finance necessary to understand new developments in the provision of infrastructure for economic development.

527 APPLIED PUBLIC FINANCE FOR INFRASTRUCTURE AND ECONOMIC DEVELOPMENT (PLCY 527) (1.5). Explores the role of infrastructure in economic development, including innovations in finance, management and technology. Covers traditional and knowledge infrastructure. Addresses trade-off between environmental protection and economic growth.

550 EVOLUTION OF THE AMERICAN URBAN LANDSCAPE (3). Examines shaping the urban built environments of the United States from the colonial era to present day. Critically examines forces that shaped our cities, and studies the values, ideals and motivations underlying efforts to plan and direct physical development of American cities.

574 POLITICAL ECONOMY OF POVERTY AND INEQUALITY (3). Introduces students to the political economy of poverty alleviation programs. Uses comparative cases to explore what types of projects, tasks and environments lead to effective and equitable outcomes, and why.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, ENVR 585, PLCY 585) (3). Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, and instruments, policy analysis, and major elements of American environmental policy. Lectures and case studies. Fall. Andrews.

591 APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (GEOG 591) (3). Prerequisite, GEOG 370 or 491, or equivalent. Applied issues in the use of geographic information systems in terrain analysis, medical geography, biophysical analysis and population geography. (GISc)

697 [270] INTERNATIONAL DEVELOPMENT AND SOCIAL CHANGE (3). Permission of the instructor. Course explores effect of the global economy on national and community development, effect of environmental degradation processes on development, and strategies to guide social change.

685 [219] WATER AND SANITATION PLANNING AND POLICY IN DEVELOPED COUNTRIES (ENVR 685) (3). Permission of the instructor. Seminar on policy and planning approaches for providing improved community water and sanitation services in developed countries. Topics include the choice of appropriate technology and level of service, pricing, metering and connection charges; cost recovery and targeting subsidies to the poor; water venting; community participation in the management and operation of water systems; and rent-seeking behavior in the provision of water supplies.

704 [204] THEORY OF PLANNING I (3). The logic of planning as a professional activity. Critical overview of current process theories leading students to develop a personal philosophy applicable to their work as planners. Fall and spring. Goldstein, Berke, faculty.

710 [210] MICROECONOMICS FOR PLANNING AND PUBLIC POLICY ANALYSIS (3). Introduction to principles of demand and supply, elasticity, marginal utility opportunity cost, pricing, production decisions, and profit maximization, cost-benefit analysis, financial appraisal, role of government, and market instruments for environmental protection. Fall. Tewari, Whittington, faculty.

714 [214] URBAN SPATIAL STRUCTURE (3). Theories and empirical evidence of the contemporary spatial development of metropolitan areas. Industrial, residential and commercial location; neighborhood change; the role of technological change and public policies; and normative perspectives. Fall. Rodríguez, Song.

724 [206] INTRODUCTION TO LAW FOR PLANNERS (3). Governmental institutions, real property, constitutional law, land use law and environmental law. Fall. Faculty.

725 [254] DEVELOPMENT DISPUTE RESOLUTION (3). Contemporary methods of resolving development disputes through negotiation, bargaining and mediation. Techniques and skills applicable to solving controversies over planning and implementation of public and private development projects. Fall. Quercia.

740 [240] LAND USE AND ENVIRONMENTAL POLICY (3). History, institutional setting, rationale of state and local land use, and environmental policies. Program and policy frameworks, political and market processes, resource utilization concepts, and contemporary development and resource management. Fall. Berke.

741 [241] LAND USE AND ENVIRONMENTAL PLANNING (3). Methods of land use planmaking. Use of GIS and spreadsheets to analyze land suitability and spatial needs. Preparation of land classification plans, land use design plans and development management programs. Spring. Berke, Song.

744 [244] DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT (3). Coordination of public powers and private actions to implement development plans and conserve environmental resources. Regulatory, public investment, incentive and policy instruments used in land use and environmental guidance systems. Fall. Burby.

745 [245] DEVELOPMENT IMPACT ASSESSMENT (3). Methods for data management and predictive analysis of the environmental, transportation and other infrastructure; fiscal and social impacts of land development projects. Impact mitigation measures are also examined. Spring. Burby.

747 [237] COASTAL MANAGEMENT POLICY (3). Analysis of national and state coastal management laws, policies and programs. Private sector, interest group, government agency and public roles in coastal resource allocation. Influence of science, values and politics. Fall. Brower, Owens.

752 [242] PROJECT AND SITE PLANNING (3). Techniques of site analysis, project programming and arrangement of structures on the land. Workshop covering design and review of urban development projects within limitations of regulatory standards and market criteria. Fall. Campanella, Song.

757 [257] PLANNING FOR HISTORICAL PRESERVATION (3). Concepts, processes and policies for historic preservation; its role in the community planning and development process. Spring. Howard, Rierson.

760 [251] REAL ESTATE INVESTMENT AND AFFORDABLE HOUSING (3). Fundamentals and techniques of real estate investment analysis, including cases and computer modeling; applications of the public interest in private investment decisions; tax and other public policies influencing real estate investments; and affordable housing. Spring. Quercia.

761 [252] HOUSING AND PUBLIC POLICY (3). A theory-based course in housing and market dynamics; the justification for government intervention and the operations of the mortgage market and construction industry. Students develop skills for housing market and policy analysis. Fall. Quercia.

763 [266] URBAN NEIGHBORHOOD REVITALIZATION (3). Social, political and economic theory of local communities. Models of neighborhood change. Neighborhood revitalization: theoretical aspects; federal, state and local programs; role of nonprofit organizations; step-by-step process for revitalizing an area. Fall. Rohe.

764 [268] TECHNIQUES IN NEIGHBORHOOD REVITALIZATION (3). The steps involved in developing neighborhood revitalization plans. Students work with local neighborhood associations in identifying both community assets and problems and the various stakeholders, conducting research on selected issues, developing and selecting strategies for addressing those issues and formulating an implementation strategy. Fall. Rohe.

765 [255] THE DEVELOPMENT PROCESS (3). The dynamics of real property development from the developer's perspective covering market research, government relations, site planning, financing, investment analysis, construction and project management and marketing. Spring. Malizia.

768 [258] SEMINAR IN COMMUNITY CAPITALISM (PLCY 768) (3). Limited to graduate students. Community capitalism reflects the convergence of business and community development interests. The seminar explores theory and applications in inner city business and capital markets, development finance and urban policies. Requires a major research project. Fall. Stegman.

770 [261] ECONOMIC DEVELOPMENT POLICY (3). Introduction to basic theories, concepts and strategies employed to pursue local and regional economic development. Clarifies similarities and distinctions with related planning perspectives including community development, investigates the economic logic behind various development initiatives, and reviews basic principles for critically examining alternative policies and programs. Spring. Goldstein, faculty.

771 [263] DEVELOPMENT PLANNING TECHNIQUES (3). Intermediate and advanced techniques for analyzing the development of local and regional economies. Social accounts, indicator construction, regional input-output models, economic and fiscal impact analysis, labor market analysis and regional economic forecasting techniques. Spring. Goldstein.

773 [264] URBAN AND REGIONAL DEVELOPMENT SEMINAR (3). Fundamental concepts and theories applied to local economic development including growth, trade, product-cycle, flexible specialization and entrepreneurship theories. Urban and regional development issues addressed in the North American, South American, European or South Asian contexts. Fall. Tewari, Malizia.

776 [267] DEVELOPMENT FINANCE (3). Community development financial institutions and loan funds for local asset building and wealth creation. Investment analysis to structure and finance local projects. Real estate and business development cases. Fall. Howarth, Malizia.

781 [234] WATER RESOURCES PLANNING AND POLICY ANALYSIS (ENVR 781) (3). Water resources planning and management. Federal and state

water resources policies. Analytical skills to identify environmental problems associated with urban water resources development. Fall. Moreau.

784 [233] ENVIRONMENTAL LAW (ENVR 784) (3). An examination of the law of resource use and development, its administration and underlying policies. Particular attention is given to water resources law, regulatory law and natural resource administration. Fall. Heath.

785 [232] PUBLIC INVESTMENT THEORY (ENVR 785, PLCY 785) (3). Prerequisite, PLAN 710 or equivalent. Basic theory, process and techniques of public investment planning and decision making, involving synthesis of economic, political and technologic aspects. Theory underlying benefit-cost analysis, adaptation to a descriptive and normative model for planning public projects and programs. Spring. Whittington.

786 [236] ENVIRONMENTAL QUALITY MANAGEMENT (ENVR 786) (3). Planning and analysis of regional environmental system with a focus on management of mass flows that affect the quality of the regional environment. Spring. Moreau.

788 [288] PUBLIC POLICY ECONOMICS I (PLCY 788) (3). Economic theory applied to policy issues. Policy issues analyzed require microeconomic theory, including theory of utility and demand, organization and operation of product and factor markets, production theory, regulation and welfare economics. Fall. Faculty.

789 [289] PUBLIC POLICY ECONOMICS II (PLCY 789) (3). Prerequisite, PLAN 788. Additional public policy issues addressed to study further applications of economic theory issues require principles of taxation, fiscal and monetary theory, and regulation and growth theory. Spring. Faculty.

799 [310] PLANNING SEMINAR (Var.). Original research, fieldwork, readings or discussion of selected planning issues under guidance of a member of the faculty. Fall or spring. Faculty.

801 [301] DESIGN OF POLICY-ORIENTED RESEARCH (PLCY 801) (3). Logic of designing research for the analysis of planning problems and the formulation of public policies. Elements of research design, case study, survey research, quasi-experimental designs and the social experiment are covered. Spring. Goldstein.

802 [302] ADVANCED SEMINAR IN RESEARCH DESIGN (PLCY 802) (3). Prerequisite, PLAN 801. Advanced treatment of topics introduced in PLAN 801. Spring. Faculty.

805 [205] THEORY OF PLANNING II (3). Construction of methodologies for evaluating various theories of planning and intensive analysis of the North American planning theory literature. Doctoral-level introduction to the area. Fall. Goldstein.

823 [222, 223] PLANNING WORKSHOP (3). Problem-solving, client-based courses designed to give students experience in applying planning theory and methods to actual problem situations in economic development, housing and community development, real estate, environmental planning, and land use and transportation. Fall or spring. Faculty.

890, 891 [200, 201] SPECIAL TOPICS IN PLANNING AND URBANISM (3). Reading, lectures and discussions to provide opportunities to develop new concepts and courses in various city and regional planning topics. Fall or spring. Faculty.

892 [353] PHD SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (ENVR 892, PLCY 892) (1). Prerequisites, doctoral standing and permission of the instructor. Ph.D. seminar on theory, methods and current research and literature in environmental management and policy. One to two seminar hours per week. Fall, spring and summer. Andrews.

896 [315] INDEPENDENT STUDY (Var.). This course permits full-time graduate students enrolled in the Department of City and Regional Planning who wish to pursue independent research or an independent project to do so under the direction of a member of the department faculty. Fall or spring. Faculty.

911 [311] PH.D. RESEARCH SEMINAR (Var.). Original research, fieldwork, readings or discussion of selected planning issues under guidance of a member of the faculty. Fall or spring. Faculty.

992 [392] MASTER'S PROJECT (3). The master's project is original work, involving a substantial degree of independent research and/or analysis. May be a research paper, critical essay, development and evaluation of a program, project or plan. Faculty.

994 [394] DOCTORAL DISSERTATION (Var.). Faculty.

Department of Classics

www.classics.unc.edu
CECIL W. WOOTEN, *Chair*

Professors

Robert Babcock, Medieval Latin
Donald Haggis (40) Greek Archaeology, Aegean Prehistory, Bronze Age and Early Iron Age Crete
James J. O'Hara (2) Latin Poetry, Latin and Greek Literature
William H. Race (42) Pindar, Greek Poetry, the Classical Tradition
James B. Rives, Ancient Religion, Roman Literature and Culture
G. Kenneth Sams (13) Greek Archaeology, Anatolian and Near Eastern Archaeology
Cecil W. Wooten (35) Greek and Latin Prose, Rhetoric, Greek and Latin Language

Associate Professors

Sharon L. James (5) Latin Poetry, Women in Antiquity
Werner Riess (8) Roman History, Latin Epigraphy, Latin Prose Authors
Peter M. Smith (26) Greek Philosophical Literature, Greek Tragedy, Homer
Monika Truemper, Hellenistic and Roman Art and Architecture

Assistant Professors

Emily Baragwanath, Greek Historiography
Brendan Boyle, Greek Political Thought, Greek Law, Ancient Ethics
Lidewijde De Jong, Roman Archaeology
Owen Goslin, Greek Poetry

Adjunct Professors

J. H. Lesher, Ancient Greek Philosophy
Jodi Magness, Classical and Near Eastern Archaeology
W. James McCoy (17) Greek History
C.D.C. Reeve (39) Ancient Philosophy, Moral Psychology, History of Philosophy
Mary C. Sturgeon (31) Greek Art
Richard J. A. Talbert (18) Roman History

Professors Emeriti

Edwin L. Brown
Carolyn L. Connor
George W. Houston
Henry R. Immerwahr
Gerhard Koeppel
Jerzy Linderski
Sara Mack
Kenneth J. Reckford
Philip A. Stadter
William C. West III

Graduate work in the Department of Classics is primarily designed to meet the needs of students who intend by intensive study and research to specialize in the classics. The M.A. prepares especially for teaching at the secondary level; the Ph.D. for research and teaching at the university level.

The department cooperates with the other language departments in the University in making available the great literatures of the world. To this end the department offers courses in Greek and Latin literature which do not require an ability to read either language in the original. Such courses are designed to emphasize aspects of the Greek and Latin genius, the forms of literature created in the ancient world and perpetuated, and the permanent contributions of Greece and Rome to Western civilization. These courses may be elected as part of a major for the Curriculum in Comparative Literature or as a minor or part of a major in other departments.

The department also offers courses in classical and medieval Latin for students of medieval studies in other departments.

The University is a contributing member of the American Academy in Rome, the American School of Classical Studies at Athens, the Archaeological Institute of America, the American Research Institute in Turkey and the Institute of Nautical Archaeology. There are thus numerous opportunities for study and archaeological activity abroad.

Requirements for Advanced Degrees

The degree of master of arts is offered with a concentration in Greek, Latin or classical archaeology. The degree of doctor of philosophy is offered with a concentration in Greek and Latin, classics with historical emphasis, classical archaeology or classical Latin and medieval studies. A minor in related departments may be permitted on application. Students may broaden their program by taking supporting work in related languages or literatures or in art, history, linguistics or philosophy.

Teaching assistance or lecture instruction equivalent to at least three contact hours a week for one semester, or until teaching competence is acquired, is required of all doctoral candidates. In practice, almost all students acquire several years of supervised teaching experience.

Requirements for advanced degrees are stated in general in the section "Graduate Degree Requirements," but exact prescription of the courses can be determined only upon knowledge of the needs of the individual applicant. A brochure describing the various programs in greater detail is available from the department, and is also online on the Web site of The Graduate School.

Graduate students in other departments may, with the approval of their department advisor, pursue a minor in medieval studies through the Department of Classics; for details see the last section of the Classics entry.

Classical Archaeology

Courses for Graduates and Advanced Undergraduates

440 [140] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3) . Permission of the department.

445 [148] ART IN THE AGE OF JUSTINIAN AND THEODORA (3). Prerequisite, any course in history, art history or classics, or permission of the instructor. Interdisciplinary course is based on monuments, history and contemporary writings of the Byzantine empire during the rule of Justinian I (527–565) and the empress Theodora (527–548). Approach will be comparative, analytical and contextual, and will include a feminist perspective. Fall. Connor.

448 [149A] CONSTANTINOPLE: THE CITY AND ITS ART (3). Prerequisite, any course in history, art history or classics, or permission of the instructor. Interdisciplinary study of the city of Constantinople, capital of the Byzantine empire from 325 to 1453, with emphasis on the artistic, social and cultural context. Includes study of monuments and their decoration, objects, contemporary documents and sources, all within a chronological, historical framework. Fall or spring. Connor.

449 [149B] IN CONSTANTINOPLE (3). Prerequisite, CLAR 448 or permission of the instructor. This course, taught primarily in Istanbul, once Constantinople, capital of the Byzantine empire from 325 to 1453, provides first-hand experience with monuments and an overview of the history, topography and culture of this great city. Summer. Connor.

460 [193] GREEK PAINTING (ART 460) (3). Prerequisite, any intermediate art history course or permission of the instructor. A survey of the development of Greek art from geometric to Hellenistic painting through a study of Greek vases, mosaics and mural paintings. Spring. Sturgeon.

461 [194] ARCHAIC GREEK SCULPTURE (ART 461) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of sculpture during the Archaic period in Greece. (Alternate years.) Sturgeon.

462 [195] CLASSICAL GREEK SCULPTURE (ART 462) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of Greek sculpture during the classical period. (Alternate years.) Sturgeon.

463 [196] HELLENISTIC GREEK SCULPTURE (ART 463) (3). Prerequisite, any intermediate art history course or permission of the instructor. A focused study of Greek sculpture in the Hellenistic period. (Alternate years.) Sturgeon.

464 [190] GREEK ARCHITECTURE (ART 464) (3). Prerequisite, CLAR 244 or permission of the instructor. The course is a survey of Greek architectural development from the Dark Age through the fourth century BCE, with particular emphasis given to the archaic and classical periods. Among the special topics to be considered are the beginnings of monumental architecture in Greece, the evolution and development of the orders, the merging of the orders and the varying interpretations of individual architects in terms of style, the definition of space and proportions. (Alternate years.) Sams.

465 [191] ARCHITECTURE OF ETRURIA AND ROME (ART 465) (3). Prerequisite, CLAR 245 or permission of the instructor. The development of architecture in Italy and in the Roman world from the ninth century BCE through the fourth century CE. The course will focus upon the development of Roman urbanism and on the function, significance and evolution of the main building types, as well as their geographic distribution. In addition, particular attention will be paid to the political, social, economic and cultural implications of public monumental as well as private residential architecture. (Alternate years.) Terrenato, Truemper.

475 [192] ROME AND THE WESTERN PROVINCES (3). Survey of the material remains of the Western provinces of the Roman Empire, with attention to their historical context and significance. Fall. Terrenato.

488 [188] THE ARCHAEOLOGY OF THE NEAR EAST IN THE IRON AGE (3). Prerequisite, CLAR 241 or permission of the instructor. A survey of the principal sites, monuments and art of the Iron Age Near East, ca. 1200 to 500 BCE. (Alternate years.) Sams.

489 [189] THE ARCHAEOLOGY OF ANATOLIA IN THE BRONZE AND IRON AGES (3). Prerequisite, CLAR 241 or permission of the instructor. A survey of Anatolian archaeology from the third millennium through the sixth century BCE. (Alternate years.) Sams.

512 [110] ANCIENT SYNAGOGUES (JWST 512, RELI 512) (3). Prerequisite, RELI 110 or permission of the instructor.. This is a course on ancient synagogues in Palestine and the Diaspora from the Second Temple period to the seventh century CE.

561 [182] MOSAICS: THE ART OF MOSAIC IN GREECE, ROME, AND BYZANTIUM (3). Prerequisite, any course in classics, art history or religious studies. Traces the development of mosaic technique from Greek antiquity through the Byzantine Middle Ages as revealed by archaeological investigations and closely analyzes how this dynamic medium conveyed meaning. Spring. Connor.

650 [153] FIELD SCHOOL IN CLASSICAL ARCHAEOLOGY (6). This course is an introduction to archaeological field methods and excavation techniques. For a period of five and one-half weeks, the student will participate in all aspects of archaeological fieldwork. The purpose is to allow the student to work

directly with field archaeologists and specialists in the field and to do the actual digging and data processing, while reflecting on the broader aims of archaeological research.

Courses for Graduates

680 [296] ROMAN SCULPTURE (ART 680) (3). This course surveys Roman sculpture from about 500 BCE to 400 CE, including different media such as portraiture, state reliefs, mythological and other reliefs, idealizing sculpture (divinities, mythological figures, heroes) sarcophagi and other funerary monuments, and decorative sculpture. Emphasis will be placed on style, iconography and the historical development of Roman sculpture in its social, cultural, political and religious contexts. (Alternate years.) Truemper.

683 [299] ETRUSCAN ART (ART 683) (3). (Alternate years.) Staff.

GREK 722 [201] GREEK EPIGRAPHY (3). See courses in Greek.

LATN 722 [202] LATIN EPIGRAPHY (3). See courses in Latin.

781 [198] AEGEAN CIVILIZATION AND NEAR EASTERN BACKGROUNDS (3). (Alternate years.) Haggis.

782 [199] THE ARCHAEOLOGY OF DARK AGE GREECE (3). Prerequisite, CLAR 243, 244 or 781, or by permission. Issues and problems in the analysis of the Greek Dark Age and its material culture from the collapse of the Bronze Age palaces to the earliest Greek city states. Fall. Haggis.

790 [290] FIELD PRACTICUM IN ARCHAEOLOGY (3). Seminar in archaeological excavation techniques to be conducted in the field. Previous excavation experience is expected. Summer or fall. Haggis, Sams, Terrenato.

794 [294] GREEK TOPOGRAPHY (ART 794) (3). Study of chief archaeological sites of Greece and of existing buildings and monuments. Attention to the problems of excavation and the role of the sites in Greek history. (Alternate years.) Sams.

797 [297] ROMAN PAINTING (ART 797) (3). (Alternate years.) Truemper.

798 [298] ROMAN TOPOGRAPHY (ART 798) (3). (Alternate years.) Terrenato.

841 [341] SPECIAL READING IN ARCHAEOLOGY (3). Fall and spring. Staff.

910 [310] SEMINAR IN ARCHAEOLOGY (3). Topics vary from year to year. Staff.

960 [358] SEMINAR IN ANCIENT ART (ART 960). (3). Fall and spring. Sturgeon.

993 [393] MASTER'S THESIS (3–6). Both semesters. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Both semesters. Staff.

Classics in English/Classical Civilization

Courses Not Requiring a Reading Knowledge of Greek and Latin

The following courses in classical literature and civilization are especially designed to supply the necessary foundation for those who, without a reading knowledge of the ancient languages, wish a broader culture or plan to specialize in modern literature, history, art, etc. When approved these courses may count as part of the major requirements in other departments. The courses may also be taken to satisfy the requirements of a minor in literature. See also English and Comparative Literature.

Courses for Graduates and Advanced Undergraduates

409 [109] HISTORICAL LITERATURE GREEK AND ROMAN (3). The study in English translation of selections from Herodotus, Thucydides, Livy, Tacitus and others, with consideration of their literary qualities and their readability as historians. (Alternate years.) Staff.

415 [115] ROMAN LAW (3). Introduction to Roman law, public and private. On the basis of Roman texts in translation (or the original if desired), consideration of the principles of Roman constitutional law and the legal logic and social importance of Roman civil law. (Alternate years.) Staff.

418 [118] BYZANTINE CIVILIZATION (3). Introduction to intellectual and social history of the Byzantine Empire from Justinian to 1453, noting the interaction of classical and Christian culture and Byzantium's influence on neighboring peoples and on the Renaissance. (Alternate years.) Connor.

540 [140] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

541 [141] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

547 [147] APPROACHES TO WOMEN IN ANTIQUITY (3). Permission of the instructor. Graduate students and senior classics majors. Intensive interdisciplinary introduction to women in antiquity, using literary, historical and visual materials.

812 [231] DIASPORA JUDAISM IN THE ROMAN WORLD (3).

Greek

Courses for Graduates and Advanced Undergraduates

409 [458] GREEK NEW TESTAMENT (RELI 409) (3). Prerequisite, GREK 222 or equivalent. Staff.

506 [726] GREEK DIALECTS (3). Permission of the instructor. Survey of the major dialects of Classical Greek and study of their derivation from Common Greek. Texts include both literary and epigraphical sources from the eighth century BCE to the Hellenistic Period.

507 [107] GREEK COMPOSITION (3). Prerequisite, GREK 221. Smith.

508 [108] READINGS IN EARLY GREEK POETRY (3). Prerequisite, GREK 221 or 222. (Alternate years.) Staff.

509 [109] READINGS IN GREEK LITERATURE OF THE FIFTH CENTURY (3). Prerequisite, GREK 221 or 222. (Alternate years.) Staff.

510 [110] READINGS IN GREEK LITERATURE OF THE FOURTH CENTURY (3). Prerequisite, GREK 221 or 222. (Alternate years.) Wooten.

540 [140] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

541 [141] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

Courses for Graduates

NOTE: One or two Greek courses numbered in the 700s are offered each semester.

722 [201] GREEK EPIGRAPHY (3). Staff.

753 [211] GREEK LYRIC POETRY (3). Race.

755 [212] GREEK TRAGEDY (3). Smith, Race, Holmes.

759 [213] GREEK COMEDY (3). Staff.

761 [214] GREEK PHILOSOPHICAL LITERATURE (3). Smith.

767 [215] GREEK RHETORIC AND ORATORY (3). Wooten.

763 [216] GREEK HISTORICAL LITERATURE (3). Staff.

771 [217] HELLENISTIC POETRY (3). Staff.

775 [218] LATER GREEK PROSE (3). Staff.

750 [251] HOMER (3). Smith, Race.

757 [252] SOPHOCLES (3). Race.

765 [253] THUCYDIDES (3). Staff.

769 [256] DEMOSTHENES (3). Wooten.

901 [301] GREEK SEMINARS (3). Topics vary from year to year. Staff.

891 [341] SPECIAL READING (3). Fall and spring. Staff.

993 [393] MASTER'S THESIS (3-6). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3-9). Fall and spring. Staff.

Latin

Courses for Graduates and Advanced Undergraduates

510 [110] INTRODUCTORY LATIN COMPOSITION (3). Prerequisite, LATN 222 or the equivalent. Review of Latin grammar and idiom, exercises in composition, introduction to stylistics. (Alternate years.) Wooten.

511 [111] READINGS IN LATIN LITERATURE OF THE REPUBLIC (3). Prerequisite, LATN 221 or 222. (Alternate years.) Riess.

512 [112] READINGS IN LATIN LITERATURE OF THE AUGUSTAN AGE (3). Prerequisite, LATN 221 or 222. (Alternate years.) James.

513 [113] READINGS IN LATIN LITERATURE OF THE EMPIRE (3). Prerequisite, LATN 221 or 222. (Alternate years.) Wooten.

514 [114] READINGS IN LATIN LITERATURE OF LATER ANTIQUITY (3). Prerequisite, LATN 221 or 222 or equivalent. Lafferty.

530 [130] AN INTRODUCTION TO MEDIEVAL LATIN (3). Prerequisite, LATN 221 or 222 or equivalent. Survey of medieval Latin literature from its beginnings through the high Middle Ages. Lafferty

540 [140] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

541 [141] PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). By permission of the department.

601/602 [101/102] ELEMENTARY LATIN FOR GRADUATE STUDENTS. These courses are designed as a preparation for the reading knowledge examination for higher degrees. Passing the examination at the end of 602 certifies that the requirement has been satisfied. One semester each. Staff.

Courses for Graduates

NOTE: One or two Latin courses numbered in the 700s are offered each semester.

722 [202] LATIN EPIGRAPHY (3). Riess.

723 [203] LATIN PALEOGRAPHY (3). Lafferty.

725 [207] LATIN COMPOSITION AND PROSE STYLES (3). Wooten.

726 [210] HISTORY OF LATIN (3).

753 [221] FRAGMENTS OF EARLY LATIN POETRY (3). Staff.

762 [222] ROMAN HISTORICAL LITERATURE (3). Study of Sallust, Caesar, Suetonius or the minor historians of the empire. Staff.

764 [224] ROMAN DRAMATIC LITERATURE (3). Study of the comedies of Plautus and Terence or the tragedies of Seneca. Staff.

765 [225] ROMAN LYRIC AND ELEGIAC POETRY (3). Study of the forms of lyric and elegiac poetry with special attention to Catullus, Horace, Tibullus or Propertius. James.

766 [226] ROMAN SATIRE (3). Study of the development of satiric forms with special attention to Horace or Juvenal. Staff.

767 [227] OVID AND LITERARY THEORY (3). Introduction to literary theory through a study of Ovid and scholarly approaches to his poetry. James.

768 [228] HORACE AND CATULLUS (3).

770 [230] TOPICS IN MEDIEVAL LATIN LITERATURE (3). Reading in selected medieval Latin prose and verse authors. Lafferty.

771 [261] CICERO: POLITICAL CAREER (3). Riess.

772 [262] CICERO: LITERARY CAREER (3).

773 [263] LUCRETIUS (3). O'Hara.

774 [264] VIRGIL (3). O'Hara.

775 [265] LIVY (3). Staff.

776 [266] OVID (3). O'Hara, James.

780 [270] PETRONIUS (3). Wooten, Riess.

784 [274] TACITUS (3). Staff.

901 [301] LATIN SEMINARS (3). Topics vary from year to year. Staff.

741 [341] SPECIAL READING (3). Fall and spring. Staff.

993 [393] MASTER'S THESIS (3-6). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3-9). Fall and spring. Staff.

Medieval Studies

Minor in Medieval Studies

Graduate majors in other departments who wish to declare a medieval studies minor may do so with the approval of their departmental advisor. Any student may, of course, take medieval studies courses without seeking a formal minor.

Requirements for the graduate minor in medieval studies are listed on the Web site of the Program in Medieval Studies: www.unc.edu/depts/medstud.

Department of Communication Studies

comm.unc.edu
DENNIS MUMBY, *Chair*

Professors

Robert C. Allen (21) Film and Media History, Media Criticism, Cultural History, History of Popular Culture
V. William Balthrop (1) Rhetorical Theory and Criticism, Cultural Studies, Argumentation
Carole Blair (40) Rhetorical Theory and Criticism, Cultural Studies, Argumentation
J. Robert Cox (3) Rhetorical Theory and Criticism, Environmental Advocacy
Paul Ferguson (5) Performance of Literature, Directing, Adaptation and Script Writing
Lawrence Grossberg (19) Cultural Studies, Popular Culture, Popular Music, Philosophy of Communication and Culture
Gorham A. Kindem (10) Documentary Production, Film History, Media Aesthetics
Dennis Mumby (36) Organizational Communication
Della Pollock (9) Performance of Literature, Performance Theory and Criticism, Cultural Studies
Lawrence B. Rosenfeld (11) Interpersonal Communication, Family Communication, Empirical Research Methodology
Julia T. Wood (12) Interpersonal Communication, Gender and Communication, Feminist Theory

Associate Professors

Richard C. Cante (33) Media and Cultural Studies
Cori Dauber (2) Rhetoric and Public Address

Ken Hillis (28) Communication Technology
Steven K. May (13) Organizational Communication, Cultural Studies
Patricia S. Parker (31) Organizational Communication and Culture, Critical Studies in Gender, Race, Organizational Leadership
Joyce Rudinsky (53) Media Studies, Electronic and Interactive Media
Francesca Talenti (52) Media Studies
Michael S. Waltman (14) Interpersonal Communication, Social Cognition
Eric Watts (66) Rhetorical Studies, African American Communication and Culture, Critical Media Studies

Assistant Professors

Renee Alexander-Craft (41) Critical/ Performance Ethnography, Performance of Literature, Critical Studies in Race and Gender
Sarah Demsey (60) Organizational Communication
Christopher Lundberg (64) Rhetoric and Public Culture, Cultural Studies, Critical Theory, and Religion
Michael Palm (68) Media Studies
Tony Perucci (67) Performance, Media and Cultural Studies
Edward Rankus (61) Media Studies
Sarah Sharma (65) Media Studies, Cultural Studies and Communication Technology

Professors Emeriti

Elizabeth Czech-Beckerman
Howard Doll
Robert J. Gwyn
William M. Hardy
James W. Pence Jr.
Beverly Whitaker Long

The Department of Communication Studies offers graduate work leading to the degrees of master of arts and doctor of philosophy. A variety of courses are offered, including interpersonal and organizational communication, media studies, performance studies, rhetoric and critical theory, and communication and cultural studies.

The program is designed to develop scholars, teachers and practitioners capable of producing, disseminating and applying knowledge in the academic community and in the broader public sphere. Graduates have continued their study in higher degree programs, accepted teaching positions at various levels, and accepted positions in training and development, administration, the arts and media production in both public and private organizations.

Master of Arts Degree

Students develop their own program of study with faculty guidance and approval. Focus and depth are expected. Students must meet the following requirements:

1. Thirty semester hours of graduate-level course work, including either three or six hours of thesis credit. Fifteen of these 30 hours should be in courses numbered 700 and over.
2. Passing COMM 702, a course to prepare students to teach.
3. Passing COMM 700, an introductory course in intellectual history in communications and related fields, with a grade of P or higher; COMM 701, Research Colloquium, with a grade of P or higher.
4. Passing at least one course designed to develop capability in critical, historical and/or social scientific methods of communication research.
5. Passing an oral comprehensive examination, usually in the third semester of study.
6. Completing a research or production-centered thesis, including an oral defense, for three or six hours of credit, depending upon the breadth of the enterprise.
7. Completing all requirements and deadlines of The Graduate School for the M.A. degree.

Doctor of Philosophy Degree

Degree Requirements

The doctoral program in communication studies emphasizes the development of programs of study appropriate to each student's particular interests and to normative expectations for sophisticated, focused dissertation research (cf. Normative Practices for Doctoral Studies, The Graduate School, UNC-Chapel Hill, November 18, 1992). Each student is required to take courses appropriate for her or his program of study from four groups. The first group, core courses, assures that each student is exposed to the variety of communication theories prominent in the discipline and current communication research practices. The second group, courses in the primary concentration, includes a research methods course in the area of primary concentration, a core seminar, advanced seminars that require students to produce original research in the area of concentration and a research practicum that serves as the springboard for dissertation work. The third group, courses in a secondary concentration, includes a minimum of three courses in an area of the department not selected as the area of specialization. Areas appropriate to the specialization and secondary concentration include interpersonal and organizational communication, media studies, communication and cultural studies, performance studies and rhetoric and critical theory. Finally, the fourth area, cognate courses, includes at least two courses outside the Department of Communication Studies related to the work done in the specialization and/or the secondary concentration.

Completion of the Ph.D. program—including course work, a qualifying examination, and a dissertation—normally requires four years of study beyond the M.A. degree.

Admission Requirements

Application for admission to the Department of Communication Studies must be made on the application form provided by The Graduate School. Applicants are admitted for the fall semester only.

All applications must be completed by January 1, and should include the following:

1. The Graduate Record Examination (GRE), with a minimum score above the 50th percentile on both the verbal and quantitative sections
2. Two official transcripts from all postsecondary educational institutions
3. Three letters of recommendation, at least two of which should include specific details about the applicant's educational background, and
4. A personal statement explaining why the applicant wishes to pursue graduate work in this department, his/her goals and any additional information not requested elsewhere.

In addition to the requirements for admission to the graduate program, applicants for the doctor of philosophy degree program must have a master's degree in communication studies or a related discipline from an accredited college or university in the United States (or its equivalent from a foreign institution) and must submit a sample of scholarly writing that shows promise of the ability to conduct research and /or write effectively for a scholarly or professional audience.

International applicants must include Test of English as a Foreign Language (TOEFL) scores. They are also required to submit a financial certificate prior to being admitted into the program.

For more information, contact
Director of Graduate Studies
Department of Communication Studies
CB# 3285, Bingham Hall
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-3285
Web: www.unc.edu/depts/comm.

Financial Aid

Financial assistance is available in several forms. Please see the financial aid chapter in this catalog for more information on various sources of available funds and deadlines.

All applicants to the department are eligible for teaching and/or research assistantships; applicants should indicate their desire for such an award on the application form. Generally, first-year students assist with two introductory undergraduate courses. Applicants for the doctor of philosophy degree may have responsibility for their own class, depending upon previous experience. All assistantship assignments are awarded on a competitive basis. In some cases out-of-state applicants who are awarded an assistantship are recommended by the department for a remission of the out-of-state portion of their tuition.

To be considered for The Graduate School's Competitive Merit Assistantship, applications must be completed by January 1.

Courses for Graduates and Advanced Undergraduates

NOTE: Courses are offered on demand except as otherwise noted.

275 HISTORY OF GERMAN CINEMA (GERM 275) (3). This course explores the major developments of German cinema. All films with English subtitles. Readings and discussions in English.

312 [112] PERSUASION (3). Prerequisite, COMM 120 or nonmajors by permission of the instructor. Examines contemporary theory and practice of influencing others' attitudes, beliefs and actions. Focuses particularly on analyzing and developing persuasive messages.

410 [110] INTRODUCTION TO QUANTITATIVE RESEARCH (3). Basics of data collection, measurement instrument development and data analytic approaches to communication research are presented to the student. Emphasis is placed on practical application of research.

411 [111] CRITICAL PERSPECTIVES (3). This course explores theories of criticism and symbolic action through readings, lecture and practical criticism of literature, media, discourse and other symbolic acts.

431 [130] ADVANCED AUDIO PRODUCTION (3). Prerequisite, COMM 140, 230, or permission of the instructor. Advanced analysis and application of the principles and methods of audio production.

432 [131] VISUAL CULTURE (3). Prerequisites, COMM 140 and 230 or permission of the instructor. Overview of, and intensive practice in, advanced directing techniques for film, video and digital media.

433 [132] INTERMEDIATE SCRIPTWRITING (3). Prerequisite, COMM 330 or permission of the instructor. A major writing project will be completed by each student, either dramatic or nonfiction for radio, television, film or stage.

434 [152] MINORITIES AND THE MEDIA (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. The course traces the development of minorities in film, radio and television, and the press, looking at trends and treatment of minorities by the media, and how and if they have changed.

436 [117] GENDER AND PERFORMANCE (WMST 437) (3). The course combines several fields, analyzing the construction of gender through science, science fiction and film. Students are exposed to science issues as they are represented in popular media.

440 [140] MEDIA THEORY AND CRITICISM (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. Intensive investigation of the nature and role of theory in media studies, as well as the nature and role of the critical encounter with particular media texts.

441 [141] AUDIO THEORY CRITICISM AND AESTHETICS (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. An examination of theories of aurality, psycho-acoustics and the development of the audio aesthetic. Course includes, but is not limited to, audio in film, video and multimedia.

442 CULTURAL STUDIES (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. This class will introduce students to the major theoretical and methodological commitments of cultural studies as a perspective on communication, culture and society.

450 [150] MEDIA AND POPULAR CULTURE (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. Examination of communication processes and cultural significance of film, television and other electronic media.

451 SPECIAL TOPICS IN MEDIA AND POPULAR CULTURE (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. A special topics course on a selected aspect of media and cultural studies.

452 FILM NOIR (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. Course combines reading about and viewing of 1940s and 1950s films combining narrative techniques of storytelling, novels and the stage with purely filmic uses of spectacle, light, editing and image.

464 [164] POETRY IN PERFORMANCE (3). Prerequisite, COMM 160 or permission of the instructor. Critical, aesthetic and rhetorical approaches to performed poetry.

466 [166] NARRATIVE FICTION IN PERFORMANCE (3). Prerequisite, COMM 160 or permission of the instructor. Study of selected short stories and novels in performance with emphasis on narrative point of view.

470 [113] POLITICAL COMMUNICATION AND THE PUBLIC SPHERE (3). A course covering the relationship between communication and political processes and institutions. Topics include media coverage and portrayal of political institutions, elections, actors and media influence on political beliefs.

521 [121] COMMUNICATION AND SOCIAL MEMORY (3). An investigation of psychological aspects of communication, particularly the perceptual and interpretive processes underlying the sending and receiving of messages.

522 [124] FAMILY COMMUNICATION (3). Prerequisite, COMM 120; or for nonmajors, permission of the instructor. Analysis and exploration of personal experiences, family systems theory and communication theory to describe, evaluate and improve family communication patterns.

523 [125] COMMUNICATION AND LEADERSHIP (3). Prerequisite, COMM 120; or for nonmajors, permission of the instructor. Critical examination of alternative theories of leadership and trends in the study of leadership; focuses on the communicative dimensions of leaderships.

524 GENDER, COMMUNICATION, AND CULTURE (3). Prerequisites, COMM 224 and 372; or for nonmajors, permission of the instructor. Course examines the speeches and other texts that announced and embodied the goals and political strategies of multiple branches of three waves of feminist activism in the United States.

525 [123] ORGANIZATIONAL COMMUNICATION (3). Prerequisites, COMM 120 and 325; or for nonmajors, permission of the instructor. Provides a critical exploration of organizational communication theory, research and application, examining the factors involved in the functioning and analysis of complex organizations.

526 [126] NONVERBAL COMMUNICATION (3). Prerequisite, COMM 120; or for nonmajors, permission of the instructor. Examines the roles and functions of nonverbal behavior in the communication process. Topic areas may

include physical appearance; body, face and eye movements; paralinguistics; haptics; nonverbal deception; the effects of environment; and personal space.

530 [127] INTRODUCTION TO PHONETICS (SPHS 530) (3). A detailed study of the International Phonetic Alphabet with emphasis on the sound system of American English. Application of phonetics to problems of pronunciation and articulation. Includes broad and narrow phonetic transcription.

532 [133] MEDIA ACTING AND PERFORMANCE (3). Study and practice in acting and performance for radio, television and motion pictures.

534 [134] NARRATIVE PRODUCTION (3). Prerequisite, COMM 230 and corequisite, one of COMM 546, 547 or 645. The course focuses on narrative, representational, and aesthetic strategies of narrative production.

540 [182] SPEECH SCIENCE (SPHS 540) (3). Introduction to the science of speech, including production, acoustics and perception.

543 [143] HISTORY OF NATIONAL MEDIA IN THE WEST (3). Study of the development of the art and craft of the film through examining individual films and topics stressing the interaction of aesthetic considerations with socio-cultural and institutional settings.

544 [144] ELECTRONICALLY MEDIATED COMMUNICATION AND INFORMATION MACHINES (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. A survey of developing telecommunication systems and technologies and their impact on the traditional electronic media and society.

545 [138] PORNOGRAPHY AND CULTURE (3). Examines the social, cultural, political, legal, historical and aesthetic implications of pornography.

546 [146] HISTORY OF FILM I, 1895 TO 1945 (3). Prerequisite, COMM 140. Studies the development of the art of film through World War II by examining individual films and filmmakers and the emergence of national cinemas through interaction among aesthetic, social, economic and technological factors.

547 [147] HISTORY OF FILM II, 1945 TO PRESENT (3). Prerequisite, COMM 140. Study of the development of the art of film from the end of World War II to the present day by examining individual films and filmmakers and the emergence of national cinemas through interaction among aesthetic, social, economic and technological factors.

548 HUMOR AND CULTURE (3). Prerequisites, COMM 140; or for nonmajors, permission of the instructor. Investigates how humor, comedy and laughter function socially and culturally through close examination of selected United States popular media texts and the primary modern theoretical writings on these issues.

549 [137] SEXUALITY AND VISUAL CULTURE (3). Examines questions about sexuality and how it has changed over time, through various media of visual communication.

553 [153] MEDIA AND ACTIVISM (3). A study of the electronic media as a feedback mechanism for community organization and social change. A variety of broadcast and nonbroadcast uses of the media are studied.

561 [160] PERFORMANCE OF LITERATURE BY WOMEN OF COLOR (WMST 561) (3). Prerequisite, COMM 160 or permission of the instructor. Explores through performance contemporary poetry, fiction, nonfiction and feminist thought by women of color in the United States.

562 [161] ORAL HISTORY AND PERFORMANCE (FOLK 562, HIST 562, WMST 562) (3). This course combines readings and field work in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history.

563 [163] PERFORMANCE OF CHILDREN'S LITERATURE (3). Prerequisites, COMM 160 and permission of the instructor. The course explores advanced performance theory while focusing exclusively on contemporary poetry, prose fiction, and drama intended for young audiences. Both solo and group performances for young viewers are included.

565 [165] RITUAL, THEATER, AND PERFORMANCE IN EVERYDAY LIFE (FOLK 565) (3). Prerequisite, COMM 160 or ENGL 126 or permission of the instructor. This course will explore the dynamics of performance as it is broadly produced within the texture of individual experiences, the interaction of community memberships and the dramas of cultural aesthetics.

566 [168] NARRATIVE IN FICTION AND FILM: ADAPTATION AND PERFORMANCE (3). Study of narrative in selected short stories and novels and their adaptation for film.

570 [183] ANATOMY AND PHYSIOLOGY OF THE SPEECH AND HEARING MECHANISM (SPHS 570) (3). Anatomy and physiology of the speech producing and aural mechanism.

571 [171] RHETORICAL THEORY AND PRACTICE (3). Prerequisite, COMM 270; or for nonmajors, permission of the instructor. Investigates contemporary theories of purposive symbolic behavior; focus is upon rational, psychological and dramatistic explanations of human behavior.

572 [172] PUBLIC POLICY ARGUMENT (3). Prerequisite, COMM 270; or for nonmajors, permission of the instructor. Analyzes argument in a variety of contexts with an emphasis on public policy and exploring tensions involved in addressing both expert and public audience in the political sphere.

573 [173] THE AMERICAN EXPERIENCE IN RHETORIC (3). Prerequisite, COMM 270; or for nonmajors, permission of the instructor. Examines public discourse from the colonial period to the present. Discourses, critical perspectives and historical periods studied will vary.

574 [174] WAR AND CULTURE (PWAD 574) (3). Examines American cultural myths about war generally and specifically about the causes of war, enemies, weapons and warriors, and the way these myths constrain foreign and defense policy, military strategy and procurement.

582 [180] INTRODUCTORY AUDIOLOGY I (SPHS 582) (3). Theory and practice of the measurement of hearing, causative factors in hearing loss, evaluation of audiometric results and demonstration of clinical procedures.

596 [191] ADVANCED INDEPENDENT STUDY/DIRECTED READING (1-3). Prerequisites, completion of at least one 300-level COMM course and departmental permission. For the communication studies major who wishes to pursue an advanced independent research project or reading program under the supervision of a selected instructor. Intensive individual research on a problem designed by instructor and student in conference.

617 [684] INTRODUCTION TO COMMUNICATION DISORDERS (3). Explores the etiology, epidemiology, assessment and educational implications of speech and language disorders.

620 [120] THEORIES OF INTERPERSONAL COMMUNICATION (3). Prerequisite, COMM 120; or for nonmajors, permission of the instructor. Course focuses on how communication is used to build and sustain interpersonal relationships. Forms and functions of communication are examined as a means of testing and defining relationships.

622 IMPACT OF DISASTERS ON FAMILIES (3). Examination of the effects of disasters on children, families and communities. Course considers strategies for disaster relief and methods for decreasing long-term psychosocial damage.

629 [129] TOPICS IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION (3). Prerequisite, COMM 120; or for nonmajors, permission of the instructor. Designed for advanced students, course provides in-depth examination of particular theories of human communication. Course focus varies. May be repeated.

635 [135] DOCUMENTARY PRODUCTION (3). Prerequisite, COMM 230; corequisite, one of COMM 546, 547, or 645. A workshop in the production of video and/or film nonfiction or documentary projects. The course will focus on narrative, representational and aesthetic strategies of documentary production.

636 [136] INTERACTIVE MEDIA (ART 406) (3). Prerequisite, COMM 140, 230 or permission of the instructor. Explores interactive media through

creative projects that include sound, video and graphic elements. Technical information will serve the broader goal of understanding the aesthetics and critical issues of interactive media.

639 [139] SPECIAL TOPICS IN MEDIA PRODUCTION (3). Prerequisite, COMM 140. A special topics course on a selected aspect of media production or writing. May be repeated.

642 SPECIAL TOPICS IN CULTURAL STUDIES (3). Prerequisites, COMM 442; or for nonmajors, permission of the instructor. This course will explore various specific topics, theories and methodologies in cultural studies.

645 [142] THE DOCUMENTARY IDEA (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. Historical and theoretical examination of expressions of the documentary idea in different eras and various modes including film, television and radio.

646 [118] ANIMATION (3). Prerequisites, COMM 130 and 230; or for nonmajors, permission of the instructor. An introduction to the art and mechanics of two-dimensional digital animation.

649 [149] THIRD WORLD MEDIA (3). The cultural and educational uses of radio and television are studied in the developing countries of Africa, Latin America and India. Emphasis will be placed on the new electronic media and their effectiveness in serving developing countries.

651 [151] CONTEMPORARY INTERNATIONAL MEDIA (3). Study of contemporary film/television within a specific international context, such as Great Britain, with particular attention to comparisons and contrasts with the United States and Hollywood.

652 MEDIA AND DIFFERENCE (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. This course examines critical and theoretical issues concerning the representation and study of various modes of difference, such as sexuality, race and gender, in specific media texts.

656 [156] WOMEN AND FILM (WMST 656) (3). This course examines the representation of women in contemporary American film and also considers women as producers of film.

658 [158] LATIN AMERICAN CINEMA (3). This course examines the films, audiences and social contexts of Latin American cinema from the 1930s to the present.

659 [159] SPECIAL TOPICS IN MEDIA STUDIES (3). Prerequisite, COMM 140; or for nonmajors, permission of the instructor. A special topics course on a selected aspect of media studies, including but not limited to media texts, contexts and/or reception. May be repeated.

660 [162] GROUP PERFORMANCE (4). Prerequisites, COMM 160, 260, one 100-level performance course and permission of the instructor. Theory and practice in adaptation, direction and group performance of texts.

662 [262] LITERATURE/PERFORMANCE OF BLACK DIASPORA (3). Focuses on interpreting the literature and culture of black people in Africa, the Caribbean, Europe and the Americas, including fiction, nonfiction and film, through performance. Participants may anticipate performing every class session.

667 [167] THE POLITICS OF PERFORMANCE (3). Prerequisite, COMM 160 or 162 or permission of the instructor. Course will address the relationship between performance and power, focusing on topics concerned with the potential for performance to contribute to social change.

669 [169] SPECIAL TOPICS IN PERFORMANCE STUDIES (3). Prerequisites, COMM 160 and one 100-level performance course or permission of the instructor. Advanced study of selected topics drawn from performance history, theory and practice. May be repeated.

675 [175] ENVIRONMENTAL COMMUNICATION AND THE PUBLIC SPHERE (ENST 675) (3). Examines communication practices that accompany citizen participation in environmental decisions, including public education campaigns of nonprofit organizations, "risk communication," media representations, and mediation in environmental disputes.

679 [179] SPECIAL TOPICS IN RHETORIC AND CULTURAL STUDIES (3). Prerequisite, COMM 270; or for nonmajors, permission of the instructor. A special topics course on a selected aspect of rhetoric and cultural studies. May be repeated.

684 [184] INTRODUCTION TO COMMUNICATION DISORDERS (EDUC 617) (3). Explores the etiology, epidemiology, assessment and educational implications of speech and language disorders.

693H [098] HONORS (3). By permission of the department. Individual projects designed by students and supervised by a faculty member.

694H [099] HONORS (3). By permission of the department. Individual projects designed by students and supervised by a faculty member.

700 [200] INTRODUCTION TO RESEARCH AND THEORY IN COMMUNICATION STUDIES I (3). Prerequisite, admission to graduate program or permission of the chair. Considers theory and philosophy in the study of communication. Surveys major paradigms of contemporary social/cultural theory (and their roots in modern philosophy) in relation to examples of communication research and practice. First of two semesters.

701 [201] INTRODUCTION TO RESEARCH AND THEORY IN COMMUNICATION STUDIES II(3). Prerequisite, admission to graduate program or permission of the chair. Considers theory and philosophy in the study of communication. Surveys major paradigms of contemporary social/cultural theory (and their roots in modern philosophy) in relation to examples of communication research and practice. Second of two semesters.

702 [360] TEACHING IN COMMUNICATION STUDIES (1). Prerequisite, must be communication studies graduate student. An introduction to teaching at the university level for new teaching assistants and graduate students hoping to have teaching-related responsibilities in communication studies. Fall.

712 [212] THE BODY AND PERFORMANCE (3). This course will explore through performance the various ways the human body is "marked" or signified in culture. Fall and spring.

713 [213] PERFORMANCE CRITICISM (3). Prerequisites, COMM 464, 466 or 660. Deals with the key methods of describing and evaluating literature and literature in performance.

722 [229] SEMINAR IN HUMAN RELATIONSHIPS (3). In-depth examination of contemporary research on communication and human relationships. Foci vary and may include intimacy, groups, families and other communication relationships.

723 [221] RESEARCH IN ORGANIZATIONAL COMMUNICATION (3). Explores theoretical, methodological and practical issues encountered in ethnographic, case study and field research on communication phenomena in organizations.

724 [225] FEMINISM, SCIENCE, AND COMMUNICATION (3). Critical examination of key feminist arguments about science and communication scholarship as conventionally defined; exploration of alternative goals, assumptions and practices for research consistent with feminist theories and methodologies.

725 [222] INTERPRETIVE STUDIES IN ORGANIZATIONAL COMMUNICATION (3). Prerequisite, COMM 525 or permission of the instructor. Focuses on the theory and practice of interpretive organizational communication research, including organizational phenomena such as culture, metaphor, symbolism, ritual and narrative. Fall.

726 [223] CRITICAL STUDIES IN ORGANIZATIONAL COMMUNICATION (3). Prerequisite, COMM 525 or permission of the instructor. Focuses on the theory and practice of critical organizational communication research, including organizational phenomena such as power, discourse and culture. Spring.

738 [238] PRODUCTION STUDIES (3). Study the integration of audio/video/film theory and practice through lectures, readings, discussions, oral presentations and the completion of audio, video and film projects.

739 [239] MEDIA PRODUCTION (3). Permission of the department. Study of problems involved in writing and producing various forms of media programming. Emphasis on script and production elements necessary to translate scripts into media products.

750 [250] CULTURAL STUDIES (3). Prerequisite, graduate standing. Introduction for graduate students to the current literature and critical perspectives in the areas of media and cultural studies.

752 MEDIA AND SOCIAL CHANGE (3). This seminar inquires into the range of relationships between media and social life, with a particular emphasis on media's role in movements for social, economic and/or cultural transformation.

753 [253] THEORIES OF THE AUDIENCE/PUBLIC (3). This course offers a sustained analysis of the ways in which the media, audience and/or public have been variously conceptualized historically, in critical theory.

754 [254] POLITICAL, INSTITUTIONAL AND ECONOMIC CONTEXTS OF MEDIA AND CULTURE (3). Prerequisite, COMM 700. A detailed analysis of the relationship between government, policy making, corporate and business interests, and various theoretical approaches to their impact on media and culture. Fall.

755 [255] HISTORY OF CULTURAL STUDIES (3). This class introduces cultural studies through its British "origins," especially but not only the work of the Centre for Contemporary Cultural Studies and the Open University.

756 NATIONAL, INTERNATIONAL, TRANSNATIONAL AND GLOBAL MOVIE/MEDIA HISTORY (3). Explores the economic, social, ideological, technological and aesthetic development of film and television as international, transnational, transcultural and global entities, questioning the viability of the concept of national cinema/media in the 21st century.

758 [258] STUDIES IN FILM AND TELEVISION (3). Graduate introduction to the study of film, television and video. This course traces the theoretical and methodological development of media studies.

760 [260] DIRECTING GROUP PERFORMANCE (3). Prerequisites, at least two performance courses at or over the 400-level. An in-depth examination of the theories and techniques of group performance.

761 [261] ADAPTATION SEMINAR (3). This seminar recognizes and applies narrative theory in understanding texts, lives and cultural practice broadly.

769 [269] TOPICS IN PERFORMANCE STUDIES (3). Prerequisite, second-year graduate students and/or consent of the instructor. Special problems in performance studies.

772 [371] SEMINAR IN CONTEMPORARY RHETORICAL THEORY (3). Advanced rhetorical theory. Special attention is paid to contemporary accounts of rhetorical invention, hermeneutics, political judgment and symbolic action. Spring.

773 [273] HISTORY OF RHETORIC (3). A critical survey of the history of rhetoric. Focus on classical and Enlightenment theories of rhetoric, with emphasis on problems of invention, persuasion and interpretation. Fall.

792 [292] PHILOSOPHY OF COMMUNICATION AND CULTURE (3). Prerequisite, COMM 700. Considers the history of and developments in the philosophy of communication and culture, as well as the role these concepts have played in western philosophy. Spring.

798 [298] TOPICS IN RESEARCH METHODS (3). Advanced study of selected topics in research methods. Topics vary.

810 [210] RESEARCH IN INTERPERSONAL COMMUNICATION (3). Prerequisite, COMM 410. Special emphasis on survey research, content analysis and experimental design. The designs and analysis of communication data gathered in lab and field settings are reviewed. The course emphasizes multivariate data analytic techniques and their interpretation.

811 [211] RHETORICAL CRITICISM (3). Prerequisite, COMM 571 or permission of the instructor. Investigates the function of rhetorical criticism, the critical method and a variety of approaches to the performance of rhetorical criticism.

821 [226] COMMUNICATION IN CLOSE RELATIONSHIPS (3). Prerequisite, COMM 620. Examination of contemporary theory and research on communication in close relationships. Topics include communication in relational formation, change and termination.

822 [322] SEMINAR IN FAMILY COMMUNICATION (3). This course is an advanced seminar in which students may study family communication and produce original research.

824 [323] SEMINAR IN FEMINIST STUDIES IN COMMUNICATION (3). Prerequisite, COMM 722. This course compares and critically evaluates the work of major feminist scholars in the field of communication. Spring.

825 [329] SEMINAR IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION (3). A variable topic seminar that permits faculty and graduate students the opportunity to explore significant historical and emerging issues in the field of communication. Spring.

841 [241] PERFORMANCE ETHNOGRAPHY (FOLK 841) (3). This seminar focuses on methods of ethnography and fieldwork ethics. Performance as theory and practice informs methodological inquiries as well as the analysis of specific ethnographic texts and case studies.

842 [342] SEMINAR IN PERFORMANCE AND CULTURAL STUDIES (FOLK 842) (3). This course focuses on performance-related issues in the emergent field of cultural studies.

843 [343] SEMINAR IN PROBLEMS IN CONTEMPORARY PERFORMANCE THEORY (FOLK 843) (3). An advanced graduate seminar, this course will address recent developments and problems in performance theory. It will consider cross- and multidisciplinary approaches to performance as sites for consideration and debate. Fall and spring.

844 [344] SEMINAR IN PERFORMANCE AND HISTORY (3). This course explores diverse relations among performance and history, including the performance of life histories, the use of spectacle in history, everyday performances of historical protocols and performance itself as an historical construct. Fall and spring.

845 [345] THE POLITICAL ECONOMY OF PERFORMANCE (3). This course examines social relations, particularly power relations, by focusing on resistance as performance and the performance of resistance arising from the dynamics and conflicts within specific locations of a political economy.

849 [351] SEMINAR IN CULTURE AND IDENTITY (3). This course looks at issues of the representation and production of identity, subjectivity, and agency—in various forms—in the practices of media.

850 [350] SEMINAR IN MEDIA STUDIES (3). Selected problems in media aesthetics. Exact topic to be covered is announced before classes begin.

851 [251] RESEARCH METHODS IN MEDIA AND CULTURAL STUDIES (3). Prerequisite, graduate standing. Introduction to the issues, methods and materials of research in media and cultural studies. Fall.

852 [352] SEMINAR IN THE HISTORY OF MEDIA (3). Application of historical research techniques to problems in the mass media. Exact topic is announced before classes begin. May be repeated.

853 [353] SEMINAR IN POPULAR CULTURE (3). This course will look at special topics in the study of popular culture. Designed for advanced graduate studies, it will consider critical responses to existing scholarship with original research.

854 SEMINAR IN MEDIA DIFFERENCE (3). This seminar explores critical theories of difference and puts them into dialogue with media representations of difference.

855 [355] SEMINAR IN CULTURAL STUDIES (3). Prerequisite, COMM 755 or equivalent. This class explores the impact of some developments in postmodernism—as an interpretive, historical and philosophical discourse on the possible development of cultural studies.

856 [356] SEMINAR IN COMMUNICATION TECHNOLOGY (3). Prerequisite, COMM 700. Examines new communication technologies, their spatial and social diffusion, and how these relate to theories of culture, politics and technology and the real-world contexts in which technologies are received. May be repeated. Spring.

857 [357] SEMINAR IN CULTURAL STUDIES AND POPULAR CULTURE (3). Prerequisite, COMM 700. This course will focus on specific topics, issues or queries of popular culture as these have been or can be studied within cultural studies. Fall.

858 [358] SEMINAR IN FEMINIST STUDIES OF FILM AND TELEVISION (WMST 858) (3). Prerequisite, graduate standing. This graduate seminar explores theoretical and practical points of contact between feminism, film and television using psychoanalysis, narrative analysis, ideological analysis and cultural studies. Spring.

859 [359] SEMINAR IN MEDIA AND CULTURAL STUDIES (3). This course, designed for advanced graduate students, will explore specialized topics in interpretive, critical and cultural research in media studies.

871 [271] RHETORIC AND SOCIAL THEORY (3). This course will draw upon contemporary discussions in both rhetorical theory and critical social theory to explore a set of tensions in the western philosophical/political ideals of the public sphere and the political subject as a discursive agent within such public spaces and venues.

872 [372] PUBLIC POLICY ARGUMENT (3). Advanced theory and practice of public argument. Examines the history of the public sphere, critical theories of its operation and its relevance to contemporary politics. Case studies change by semester. Spring.

879 [379] TOPICS IN RHETORICAL AND CULTURAL STUDIES (3). Prerequisite, COMM 811. Special problems in rhetorical and cultural studies.

900 [390] RESEARCH PRACTICUM (1–3, repeatable to a maximum of 6). Prerequisite, permission of departmental coordinator of internships. Individualized practical experience supervised by a faculty adviser and by the departmental coordinator of internships. May be repeated once with approval of departmental faculty.

901 [391] DIRECTED RESEARCH (3). Prerequisite, permission of the graduate faculty member involved. Individual research on a problem defined by the graduate student and graduate faculty member in conference. May be repeated once with the permission of departmental graduate faculty.

902 [392] RESEARCH PRACTICUM IN MEDIA AND CULTURAL STUDIES (3). Prerequisites, COMM 750, 851 and permission of the instructor. Individualized directed research by advanced students supervised by a member of the graduate faculty. May be repeated once with permission of graduate faculty. Fall, spring and summer.

903 [399A] RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1–3). Individualized practical research. Fall and spring.

904 [399B] RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1–3). Individualized practical research. Fall and spring.

905 [399C] RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1–3). Individualized practical research. Fall and spring.

906 [399D] RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1–3). Individualized practical research. Fall and spring.

907 [399E] RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1–3). Individualized practical research. Fall and spring.

993 [393] MASTER'S THESIS (3 or 6). Fall and spring. Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (Var.).

Department of Computer Science

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JAN F. PRINS, *Chair*

Professors

James Anderson (62) Distributed and Concurrent Algorithms, Real-Time Systems, Fault-Tolerant Computing, Formal Methods

Sanjoy K. Baruah (78) Scheduling Theory, Real-Time and Safety-Critical System Design, Computer Networks, Resource Allocation and Sharing in Distributed Computing Environments

Gary Bishop (39) Hardware and Software for Man-Machine Interaction, 3D Interactive Computer Graphics, Virtual Environments, Tracking Technologies, Image-Based Rendering

Frederick P. Brooks Jr. (9) 3D Interactive Computer Graphics, Human-Computer Interaction, Virtual Worlds, Computer Architecture, the Design Process

Prasun Dewan (63) User Interfaces, Distributed Collaboration, Software Engineering Environments, Object-Oriented Databases, Mobile Computing

Henry Fuchs (11) High-Performance Graphics Hardware, 3D Medical Imaging, Head-Mounted Displays, Virtual Environments

John H. Halton (26) Applications of Combinatorial and Probabilistic Methods and of Scientific and Mathematical Analysis to Computational, Scientific, and Engineering Problems

Kevin Jeffay (40) Real-Time Systems, Operating Systems, Distributed Systems, Multimedia Networking, Computer-Supported Cooperative Work, Performance Evaluation

Anselmo A. Lastra (52) Interactive 3D Computer Graphics, Hardware Architectures for Computer Graphics

Ming C. Lin (72) Physically-Based and Geometric Modeling, Applied Computational Geometry, Robotics, Distributed Interactive Simulation, Virtual Environments, Algorithm Analysis

Dinesh Manocha (58) Geometric and Solid Modeling, Physically-Based Modeling, Computer Graphics, Simulation-Based Design, Symbolic and Scientific Computation, Computational Geometry

Fabian Monrose (99) Computer and Network Security, Biometrics and Techniques for Strong User Authentication

Stephen M. Pizer (6) Image Analysis and Display, Human and Computer Vision, Graphics, Numerical Computing, Medical Imaging

David A. Plaisted (28) Mechanical Theorem Proving, Term Rewriting Systems, Logic Programming, Algorithms

Jan F. Prins (33) Parallel Algorithms, Languages, and Architectures; Computational Biology and Bioinformatics; High-Level Programming Languages; Compilers; Computer-Based Assistive Technologies

Daniel A. Reed (92) Design of Very High-Speed Computers, Providing New Computing Capabilities for Scholars in Science, Medicine, Engineering and the Humanities; Tools and Techniques for Capturing and Analyzing the Performance of Parallel Systems; Collaborative Virtual Environments for Real-Time Performance Analysis

Michael K. Reiter (95 Computer and Network Security, Distributed Systems, Applied Cryptography

John B. Smith (25) Computer-Supported Cooperative Work, Hypermedia Systems, World Wide Web Architecture and Programming, Java Object Storage and Access

Jack S. Snoeyink (79) Computational Geometry, Algorithms for Geographical Information Systems and Computational Biology, Geometric Modeling and Computation, Theory of Computation

David Stotts (59) Computer-Supported Cooperative Work, Hypermedia, Software Engineering and Formal Methods, Programming Languages and Concurrency, Interoperable Distributed Systems

Stephen F. Weiss (10) Information Storage and Retrieval, Natural Language Processing, Communications and Distributed Systems, Computer-Supported Cooperative Work

Associate Professors

Kye S. Hedlund (22) Computer-Aided Design, Computer Architecture, Algorithm Design and Analysis, Parallel Processing
Ketan Mayer-Patel (80) Multimedia Systems, Networking, Multicast Applications
Leonard McMillan (87) Computer Graphics, Image Processing, Computer Vision, Multimedia, Microelectronics, Computer Organization
Marc Pollefeys (89) Computer Vision, Image-Based Modeling and Rendering, Image and Video Analysis, Multi-View Geometry
Montek Singh (84), High-Performance and Low-Power Digital Systems, Asynchronous Circuits and Systems, System-on-a-Chip Design, VLSI CAD
Wei Wang (90) Data Mining, Database Systems, Bioinformatics

Assistant Professors

Jasleen Kaur (88) Design of Networks and Operating Systems, Specifically, Resource Management for Providing Service Guarantees, Internet Measurements, Overlay and Peer-to-Peer Networks, Router Architectures
Svetlana Lazebnik (96) Computer Vision and Object Recognition
Marc Niethammer (98) Quantitative Image Analysis, Cellular Imaging, Shape Analysis, Visual Tracking and Estimation Theory

Research Professors

F. Donelson Smith (42) Computer Networks, Operating Systems, Distributed Systems, Multimedia, Computer-Supported Cooperative Work
Russell M. Taylor II (69) 3D Interactive Computer Graphics, Virtual Worlds, Distributed Computing, Scientific Visualization, Human-Computer Interaction

Research Associate Professors

Gregory F. Welch (71) Human-Machine Interaction, 3D Interactive Computer Graphics, Virtual/Augmented Environment Tracking Systems, Shared Virtual Environments and Telecollaboration
Mary C. Whitton (81) Virtual and Augmented Reality Systems for Data Visualization, Computer Graphics System Architectures

Research Assistant Professor

Jan-Michael Frahm (97) Computer vision, Image-based Modeling, Image and Video Analysis, Multi-view Geometry, Geometric and Photometric Camera Calibration, Markerless Augmented Reality

Lecturers

Timothy L. Quigg (83) Intellectual Property Rights, Industrial Relations, Contract Management, Research Administration
Leandra Vicci (35) Information Processing Hardware: Theory, Practice, Systems, and Applications
Jeannie M. Walsh (56) Computer Education; Social, Legal, and Ethical Issues Concerning Information Technology

Adjunct Professors

Elizabeth Bullitt (111), Computer-Aided Surgery, Computer-Aided Diagnosis
Rob Fowler (110) High Performance Computing
Guido Gerig (75) Image Analysis, Shape-Based Object Recognition, 3D Object Representation and Quantitative Analysis, Medical Image Processing
M. Gail Jones, (113) Science Education, Gender and Science, High-Stakes Assessment, Nanotechnology Education, Haptics and Learning
J. Stephen Marron (114) Smoothing Methods for Curve Estimation
Diane Pozefsky (93) Computer-Supported Cooperative Work, Distributed Systems, Mobile Computing, Networking, Software Engineering and Environments
Julian Rosenman (112) Computer Graphics for Treatment of Cancer Patients, Contrast Enhancement for X-Rays
Richard Superfine(115) Condensed Matter Physics, Biophysics, Microscopy
Sean Washburn (116) Condensed Matter Physics, Materials Science

Adjunct Associate Professors

Stephen R. Aylward (109) Computer-Aided Diagnosis, Computer-Aided Surgical Planning, Statistical Pattern Recognition, Image Processing, Neural Networks
Chris Healey (105) Computer graphics, Scientific Visualization, Perception and Cognitive Vision, Color, Texture, Databases, and Computational Geometry
Sarang C. Joshi (101) Image Analysis, Medical Image Processing, Computer Vision, Computational Anatomy
Frank Mueller (121) Embedded/Real-Time Systems, Parallel / Distributed Systems, Compilers/Code Optimization
Steven E. Molnar (108) Architectures for Real-Time Computer Graphics, VLSI-Based System Design, Parallel Rendering Algorithms
Andrew B. Nobel (107) Statistical Analysis of Microarrays, Analysis of Internet Traffic, Nonparametric Inference, Pattern Recognition: Clustering and Classification
Diane H. Sonnenwald (106) Collaboration among Multidisciplinary, Cross-Organizational Teams; Collaboration; Human Information Behavior; Digital Libraries

Adjunct Assistant Professors

Hye-Chung (Monica) Kum (103) Program Evaluation, Management of Human Services Agencies, Social Welfare Policy and Program Analysis Using KDD (Knowledge Discovery in Databases), Technology on Social Welfare Administrative Data, Research Methods
Maria Papadopouli (102) Applications for Mobile, Wireless, Ad Hoc, and Sensor Networks; Pervasive Computing

Adjunct Research Professors

Nicholas England (119) Systems Architectures for Graphics and Imaging, Scientific Visualization, Volume Rendering, Interactive Surface Modeling
John Poulton (120) Graphics Architectures, VLSI-Based System Design, Design Tools, Rapid System Prototyping

Adjunct Research Associate Professor

Lars Nyland (117) High Performance Computing, Hardware Systems, Computer Graphics and Image Analysis, Geometric Modeling and Computation

Adjunct Research Assistant Professors

Mark Foskey (118) Computer-Aided Surgical Planning, Computer-Aided Diagnosis, Geometric Computation
Martin Styner (94) Medical Image Analysis, 3D Object Shape Representation and Quantitative Shape Analysis, Image Processing

Professors Emeriti

Peter Calingaert
Gyula A. Magó
Donald F. Stanat

The Department of Computer Science at UNC-Chapel Hill, established in 1964, was one of the first independent computer science departments in the United States. Its primary missions are research and graduate and undergraduate teaching. Research particularly emphasizes

- algorithms and complexity theory
- bioinformatics and computational biology
- collaborative systems
- computer graphics and image analysis
- computer vision
- databases and data mining
- distributed systems
- geometric modeling and computation
- haptics
- hardware systems and design
- high-performance and parallel computing
- medical imaging
- multimedia systems
- networking

- operating systems
- real-time systems
- scientific computing
- security
- software engineering methods and environments and
- user interfaces

The M.S. and Ph.D. curricula are oriented toward the design and application of real computer systems and toward that portion of theory that guides and supports practice. The Ph.D. program prepares teachers and researchers for positions with universities, government research laboratories and industry. Academic employment ranges from four-year colleges, where teaching is the primary focus, to positions at major research universities. The M.S. program prepares highly competent and broadly skilled practitioners. A majority of the master's graduates work in industry, in companies ranging from small start-up operations to government labs and large research and development corporations.

Most of the department's approximately 150 graduate students are full-time. Students contribute to nearly every aspect of the department's operation. In addition to taking a wide variety of courses, they participate in groundbreaking research, teach, attend research group meetings and can serve on committees that affect all aspects of life in the department.

The Computer Science Students Association sponsors both professional and social events and represents the students in departmental matters. Its president is a voting member at faculty meetings.

Facilities

Sitterson Hall, opened in 1987, provides 74,000 square feet of sophisticated, state-of-the-art research facilities and office space for all members of the department. The building is organized in "clusters" to create research communities featuring shared laboratories and open conference areas to facilitate interaction among students and faculty. The building contains the 60-seat C. Hugh Holman video teleclassroom, a 125-seat auditorium; the Lib Moore Jones Faculty Conference Room; a reading room; and various research laboratories, conference areas and study areas.

Graduate students have access to all of the department's research and teaching facilities, including specialized research laboratories for graphics and image processing, computer building and design, and collaborative, distributed and parallel systems. The laboratories, offices, conference areas and classrooms are bound together by the department's fully integrated, distributed computing environment.

General Computing Environment

The department maintains a rich and varied computing environment ranging from standard IBM and Dell PCs (running Windows XP, Linux or FreeBSD), Macs (running OS/X), a few Suns (Solaris) and one big SGI (IRIX) to specialized research equipment. These are interconnected by a high-speed data network with gigabit switches. A full infrastructure (including desktop computers with 100Mb switched connections, AFS file system and backups, in an office with fiber, voice and video) is provided for all students. The department's open lab structure means that all specialized equipment is available to all students.

Sitterson Hall has wireless connectivity throughout the building, and holds the Campus Internet II connection. The network is connected to the North Carolina Research and Education Network (NC-REN), a statewide network that links research and educational institutions. All classrooms and many offices are equipped with projectors. A two-way video classroom and teleconference room allow connection to any institution served by the network, including all of the University of North Carolina system's 16 campuses, Duke University, Wake Forest University and other public and non-profit institutions.

Libraries

Students have access to the entire University library system, which includes a major academic affairs library and numerous satellite libraries containing more than 5,000,000 books and periodicals, and access to libraries at North Carolina State and Duke universities with a unified on-line searching capability. The Brauer Library, located in adjacent Phillips Hall, is a satellite library with extensive holdings in computer science, mathematics, operations research, physics and statistics.

Degree Requirements

Graduate Curriculum

A flexible course of study for the M.S. and Ph.D. degrees focuses on areas of choice and accommodates differences in students' backgrounds. The two degree programs share a basic distribution requirement of four courses chosen from theoretical, systems and applied subject areas. The Ph.D. program includes work in specialized areas, preparation for teaching and active involvement in advanced research.

Master of Science

An M.S. candidate must earn 30 semester hours of credit in courses numbered 400 or higher, of which up to six hours may be transferred from another institution or graduate program, and of which 18 hours must be completed in the Computer Science Department. Satisfactory completion of the distribution requirement provides 12 hours of credit. The remaining credits are earned in areas of specific interest, and may include course work, as needed, to address the following requirements:

- The technical writing requirement may be satisfied in one of three ways: 1) by taking the technical writing course, COMP 911, 2) by writing a thesis or 3) by writing a technical document in either academic or nonacademic work that has been reviewed and accepted (this may include a previously written thesis or dissertation).
- The program product requirement may be satisfied by taking the software engineering course, COMP 523, or by presenting satisfactory documentation of previous experience with the development of a significant software system.
- The background preparation requirement reflects the body of material that is prerequisite to the department's graduate courses. Courses needed, if any, to satisfy this requirement are decided in consultation with the candidate's advisor, course instructors and the graduate studies committee.

A thesis is optional; if one is written, it counts for six hours. A comprehensive exam is required and has two possible forms: 1) satisfactory completion of a comprehensive paper or 2) an oral exam covering material from the courses in the candidate's program of study. While either exam is sufficient for the M.S. program, a comprehensive paper is required for the Ph.D. program. A student with an assistantship generally completes the M.S. degree in four semesters or fewer.

Doctor of Philosophy

Admission to the Ph.D. program is by oral qualifying examination and recommendation of the faculty. There is no credit hour requirement for the Ph.D. program, but a Ph.D. candidate must complete courses to satisfy the distribution requirement and any needed background preparation, and must write a comprehensive paper. A Ph.D. candidate

proposes an individual program of study, typically 15 to 18 hours. The program of study includes a primary and secondary concentration in computer science, training in mathematics and a supporting program of external courses or a foreign language. Previous course work can be used to satisfy much of the program of study. A candidate must also satisfy the program product requirement, teach a course, participate in the technical communication seminar, pass an oral examination in the proposed dissertation area and submit and defend a dissertation that presents an original contribution to knowledge. The normal time needed to complete the degree by a full-time student with an assistantship is five years.

Breadth Requirement

A Ph.D. student fulfills the breadth requirement by satisfactory completion of six courses from the list below, with at least one course from each area, and a M.S. student fulfills the breadth requirement by satisfactory completion of three courses. Grades earned in these courses must satisfy additional requirements according to the degree program (M.S. or Ph.D.).

Theory and Formal Thinking

455 Models of Languages and Computation
651 Computational Geometry
662 Scientific Computation
735 Distributed and Concurrent Algorithms
737 Real-Time Systems
750 Algorithm Analysis
752 Mechanized Mathematical Inference
764 Monte Carlo Method
766 Visual Solid Shape
767 Geometric and Solid Modeling
790–006 Medial Representations
790–078 Real-Time Scheduling Theory
790–090 Data Mining
790–090 Bioalgorithms

Systems and Hardware

431 Internet Services and Protocols
520 Compilers
523 Software Engineering Laboratory
530 Operating Systems
541 Digital Logic and Computer Design
631 Computer Networks
633 Parallel and Distributed Computing
720 Compilers
723 Software Design and Implementation
730 Operating Systems
734 Distributed Systems
740 Computer Architecture and Implementation
741 Elements of Hardware Systems
744 VLSI Systems Design
831 Internet Architecture and Performance
832 Multimedia Networking
841 Advanced Computer Architecture
790–042 OS Implementation
790–052 Graphics Hardware Architectures
790–058 GPGP
790–062 Real Time Operating Systems
790–084 Clockless Computing
790–088 Research Topics in Networking
790–095 Computer Security

Applications

665 Images, Graphics and Vision
715 Visualization in the Sciences
768 Physically Based Modeling and Simulation
770 Computer Graphics
775 Image Processing and Analysis
776 Computer Vision in our 3D World
870 Advanced Image Synthesis
872 Exploring Virtual Worlds
875 Recent Advances in Image Analysis
790–058 Dynamic Datasets
790–058 Robot Motion Planning
790–063 Collaborative Systems
790–072 Haptics
790–087 Xbox Science
790–089 3D Urban Modeling
790–093 Serious Games
790–096 Computer Vision and the Web

Approved Courses Outside of Computer Science

BIOS 600 Principles of Statistical Inference
MATH 662 Scientific Computation II
STOR 555 Mathematical Statistics

Comprehensive Paper

A comprehensive paper is a survey of three or more technical papers that span multiple subfields of computer science and have a common thread. The comprehensive paper is written in one semester and is organized as an issue-based survey of approximately 5,000 words, emphasizing the integration of concepts found in the subject papers. Faculty members can suggest suitable collections of papers, but students may propose a collection of subject papers as well. Two faculty members must agree to read the comprehensive paper for style and content. The student follows a schedule of milestones for drafts and revisions. Both faculty members must accept the final revision for the comprehensive paper requirement to be satisfied. Concurrent registration in the technical writing class, COMP 911, is recommended but not required. The satisfactory completion of a comprehensive paper satisfies the technical writing requirement.

Admissions and Financial Aid

Admission to the department is highly competitive. Although the department welcomes promising students from all disciplines, entering students must have a substantial background in both mathematics and computer science. This background normally includes at least six semester courses in mathematics and six in computer science. The department considers knowledge of the following subjects to be essential preparation for the graduate program:

- Differential and integral calculus
- Discrete mathematics: sets, relations, functions, algebra
- Linear algebra or matrix theory
- Mathematical probability, preferably calculus-based
- Structured programming techniques
- Data structures and abstract data types and
- Computer organization

Most entering students have studied all but two or three of the following subjects, which are required preparation for the graduate program:

- Design and analysis of algorithms
- Formal languages and automata theory
- Databases
- Operating systems
- Compilers
- Digital logic techniques
- Numerical computing methods
- Programming languages and
- Software engineering

Students who are admitted but who have not completed all the requirements must complete them after admission. Preference is given to applicants who are solidly prepared, especially in mathematics.

Previous Degrees. A baccalaureate degree is required, with a grade point average of at least B (3.0/4.0); most entering students have a GPA of more than 3.5.

GRE. High scores on all three parts of the General Aptitude Test of the Graduate Record Examination (GRE) are also recommended. A minimum of 80th percentile on the verbal and 90th percentile on the quantitative and analytical sections is recommended (a score of 5 is recommended for the Writing Assessment). In recent years, most entering students have averaged in the 90th percentile or higher on each of the three sections. Allowances are made in interpreting the verbal test scores of applicants whose native language is not English. Although GRE Advanced Test scores are not required, applicants are encouraged to take the advanced test in computer science, mathematics, engineering or physics, as appropriate. Standardized test scores must be reported directly by the Educational Testing Service (ETS) and no more than five years old. If you did not specify the UNC-Chapel Hill Graduate School (institution code #5816) as a score recipient at the time of taking the test, or if your scores were sent more than one year ago, please contact the Educational Testing Service to request that your scores be sent to the department.

TOEFL. Applicants whose native language is not English must submit Test of English as a Foreign Language (TOEFL) scores. Applicants from Australia, the Bahamas, Canada (except Quebec), England, Ghana, Ireland, India, Jamaica, New Zealand, Nigeria, Scotland, St. Vincent and the Grenadines, Trinidad, Tobago and Wales are exempt from the TOEFL requirement and should not submit test scores. Also exempt from the TOEFL requirement are those who have received a degree from a university in the United States. The required minimum total score of 233 on the Computer-Based Test (equivalent to 575 on the Paper-Based Test or 90 on the Internet-Based Test). The department gives preference to applicants who score above 273 CBT (640 PBT; 111 IBT). Test scores, which can be no more than two years old, must be reported directly by ETS. If you did not specify the UNC-Chapel Hill Graduate School (institution code #5816) as a score recipient at the time of taking the test, or if your scores were sent more than one year ago, please contact the Educational Testing Service to request that your scores be sent to the department.

Personal Statement. Each applicant must submit a personal statement directly to the department. The statement, between a half page and two pages long, should include

- Objectives in pursuing graduate study
- Identification of fields within computer science in which the applicant has a particular interest
- Information that is relevant to the applicant's qualifications for graduate study but that has not been included already in the application (e.g., major academic projects, papers presented or published, and nonacademic computer experience)
- An informative title or a brief description of any course listed on the applicant's transcript without a title (or with a vague title such as "Mathematics II");
- A list of courses taken or planned that do not yet appear on a transcript and
- An e-mail address, if available

Recommendations. Three letters of recommendation must be submitted electronically. Letters written by an applicant's present or former professors are usually more informative than those written by employers or colleagues.

Sponsorship. Because of the large number of applicants, the department's faculty members are unable to provide individual assessments of an applicant's chances for admission. Applicants cannot improve their chances of admission by finding a faculty sponsor within the department, because all admissions decisions are made by a faculty committee that reviews all applications, ranks the applicants by overall merit, and makes decisions on admission and financial support based on the application material submitted. In particular, students are not admitted by research project directors; contacting individual faculty members whose research is of interest has no effect on one's chances of being admitted.

How to Apply. Admission is based solely on merit. The University of North Carolina at Chapel Hill is an affirmative action, equal opportunity institution. Prospective applicants who clearly surpass the minimum requirements are encouraged to apply. You can submit an electronic application or write for application materials to The Graduate School, CB# 4010, 200 Bynum Hall, UNC-Chapel Hill, Chapel Hill, N.C. 27599-4010. Telephone: (919) 966-2611. Web: gradschool.unc.edu/students_prospective.html. The Graduate School's Web site includes information on applying and online application forms. Domestic applicants (U.S. citizens and resident aliens) should check gradschool.unc.edu/applicant_dom.html. International applicants should refer to gradschool.unc.edu/applicant_intl.html.

Financial Support. During the academic year, most computer science students are supported by assistantships and fellowships. The stipend for research and teaching assistantships for the nine-month academic year 2008–2009 will be $16,600 (20 hours a week). Also, at no cost to them, students are covered by a comprehensive major medical insurance program, underwritten by Blue Cross/Blue Shield of North Carolina. Full-time summer employment on a research project is normally available to students who would like to receive support. The rate for summer 2009 will be $850 per week (40 hours) for 10 to 12 weeks. Alternatively, students may gain professional experience through summer internships with companies in the Research Triangle area or in other parts of the country. The combined annual financial package for our graduate assistants is approximately $26,800, depending on the type of summer support. Students with assistantships qualify for a Graduate Student Tuition Grant and pay no tuition. They are, however, responsible for paying student fees of approximately $800 per semester. Graduate Student Tuition grants typically cover M.S. students for four semesters of study and Ph.D. students for 10 semesters of study. Annual living costs for single graduate students in the Chapel Hill area are estimated to be $15,000 or higher. On-campus housing is available for both single and married students.

The department provides a $500 educational fund each semester to any student who receives a competitive fellowship not granted by UNC-Chapel Hill. The fund may be used for education-related expenses including books, journals, travel, computer supplies and accessories, and professional memberships. The department also awards a $1,500 supplement each semester to nonservice fellowship holders who join a research team.

To apply for an assistantship, the applicants should check the appropriate item on the admissions application form. Applicants for assistantships are automatically considered for all available fellowships. Students can expect continued support, contingent on satisfactory work performance and academic progress.

Students are assigned to specific research projects just prior to the start of each semester, after faculty members and students have had an opportunity to meet and to discuss their interests.

Deadlines. The fall semester runs from mid-August to mid-December; the spring semester from early January to early May. Applications for fall admission complete with a personal statement, all transcripts and recommendations should be received by The Graduate School no later than January 1. To ensure meeting that deadline, applicants are encouraged to take the Graduate Record Examination (GRE) no later than December 1. Early submission of applications is encouraged. International applicants should complete their applications earlier to allow time for processing financial and visa documents.

For more information, write to the Director of Graduate Admissions, Department of Computer Science, CB# 3175, Sitterson Hall, Chapel Hill, N.C. 27599-3175, or send electronic mail to admit@cs.unc.edu. Interested persons are encouraged to visit the department's Web site, www.cs.unc.edu.

Courses

401 [114] FOUNDATION OF PROGRAMMING (4). Prerequisite, a course in COMP 110–129. Advanced programming. Program specifications, preconditions, postconditions, loop invariants. Linear data structures, searching, and sorting. Algorithm paradigms and analysis. Fall and spring. Dewan, Weiss.

410 [121] DATA STRUCTURES (3). The analysis of data structures and their associated algorithms. Abstract data types, lists, stacks, queues, trees and graphs. Sorting, searching, hashing. Fall and spring. Hedlund, staff.

411 [120] COMPUTER ORGANIZATION (3). Digital logic, circuit components. Data representation, computer architecture and implementation, assembly language programming. Fall and spring. Bishop, Fuchs.

416 [117] INTRODUCTION TO WWW PROGRAMMING (3). Client-side programming in Java for the World Wide Web. Introduction to TCP/IP, HTTP and Web architecture. Emphasis on applet programming and component programming using threads, simple client-server applications, and XML. Fall. J. Smith, Mayer-Patel, Dewan.

426 [118] ADVANCED WWW PROGRAMMING (3). Prerequisite, COMP 416. Server-side programming in Java for the World Wide Web. Emphasis on servlet programming and distributed component programming using APIs for object serialization, remote method invocation, database connectivity and XML generation. Spring. J. Smith, Mayer-Patel, Dewan.

431 [123] INTERNET SERVICES AND PROTOCOLS (3). Prerequisites, COMP 410 and 411. Application-level protocols HTTP, SMTP, FTP, transport protocols TCP and UDP, and the network-level protocol IP. Internet architecture, naming, addressing, routing and DNS. Sockets programming. Physical-layer technologies. Ethernet, ATM and wireless. Spring. Jeffay, F. D. Smith.

455 [181] MODELS OF LANGUAGES AND COMPUTATION (3). Prerequisites, MATH 381 or other evidence of mathematical maturity, and COMP 110 or equivalent experience. Introduction to the theory of computation. Finite automata, regular languages, pushdown automata, context-free languages and Turing machines. Undecidable problems. Spring. Anderson, Halton, Plaisted, Weiss, Snoeyink, Prins.

486 [170] APPLICATIONS OF NATURAL LANGUAGE PROCESSING (INLS 512) (3). Prerequisite, COMP 110, 116 or 121, or graduate standing in information and library science. Study of applications of natural language processing techniques and the representations and processes needed to support them. Topics include interfaces, text retrieval, machine translation, speech processing and text generation.

487 [172] INFORMATION RETRIEVAL (INLS 509) (3). Prerequisites, COMP 110 or 121, and INLS 261. Study of information retrieval and question answering techniques, including document classification, retrieval and evaluation techniques, handling of large data collections and the use of feedback.

520 [140] COMPILERS (3). Prerequisites, COMP 410 and 411. Design and construction of compilers. Theory and pragmatics of lexical, syntactic and semantic analysis. Interpretation. Code generation for a modern architecture. Run-time environments. Includes a large compiler implementation project. Fall. (Alternate years.) Prins.

521 [130] FILES AND DATABASES (3). Prerequisites, COMP 410 and 411, MATH 381. Placement of data on secondary storage. File organization. Database history, practice, major models, system structure and design. Fall. Stotts, Weiss.

523 [145] SOFTWARE ENGINEERING LABORATORY (3). Prerequisites, COMP 410 and 411. Organization and scheduling of software engineering projects, structured programming and design. Each team designs, codes, and debugs program components and synthesizes them into a tested, documented program product. Spring. Stotts.

524 [144] PROGRAMMING LANGUAGE CONCEPTS (3). Prerequisite, COMP 410. Concepts of high-level programming and their realization in specific languages. Data types, scope, control structures, procedural abstraction, classes, concurrency. Run-time implementation. Spring. Staff.

530 [142] OPERATING SYSTEMS (3). Prerequisites, COMP 410 and 411. Types of operating systems. Concurrent programming. Management of storage, processes, devices. Scheduling, protection. Case study. Students implement significant components of a small operating system. Fall. (Alternate years.) Jeffay.

541 [160] DIGITAL LOGIC AND COMPUTER DESIGN (4). Prerequisite, COMP 411. This course is an introduction to digital logic as well as the structure and electronic design of modern processors. Students will implement a working computer during the laboratory sessions. Spring. Lastra, Singh, McMillan, Bishop.

550 [122] ALGORITHMS AND ANALYSIS (3). Prerequisites, COMP 410 and MATH 381. Formal specification and verification of programs. Techniques of algorithm analysis. Problem-solving paradigms. Survey of selected algorithms. Fall and spring. Anderson, Hedlund, Lin, Manocha, Plaisted.

575 [136] INTRODUCTION TO COMPUTER GRAPHICS (3). Prerequisites, COMP 410 and MATH 547. Hardware, software and algorithms for computer graphics. Scan conversion, 2-D and 3-D transformations, object hierarchies. Hidden surface removal, clipping, shading and antialiasing. Not for graduate computer science credit. Fall. Staff.

590 [190] TOPICS IN COMPUTER SCIENCE (1-21). Prerequisite, permission of the instructor. This course has variable content and may be taken multiple times for credit. Fall and spring. Staff.

631 [234] COMPUTER NETWORKS (3). Prerequisites, COMP 431, 530 and knowledge of probability and statistics. Topics in computer networks, including link layer protocols, switching, IP, TCP and congestion control. Additional topics may include peer-to-peer infrastructures, network security and multimedia applications. Fall. Kaur, Jeffay, F. D. Smith, Mayer-Patel, Papadopouli.

633 [203] PARALLEL AND DISTRIBUTED COMPUTING (3). Prerequisites, COMP 530 and 550. Principles and practices of parallel and distributed

computing. Models of computation. Concurrent programming languages and systems. Architectures. Algorithms and applications. Practicum. Spring. Prins.

651 [281] COMPUTATIONAL GEOMETRY (3). Prerequisite, undergraduate analysis of algorithms course (e.g., COMP 550) or permission of the instructor. Design and analysis of algorithms and data structures for geometric problems. Applications in graphics, CAD/CAM, robotics, GIS and molecular biology. Fall. (Odd years.) Snoeyink, Lin.

662 [250] SCIENTIFIC COMPUTATION II (ENVR 662, MATH 662) (3). Prerequisite, MATH 661. Theory and practical issues arising in linear algebra problems derived from physical applications, e.g., discretization of ODEs and PDEs, linear systems, linear least squares, eigenvalue problems, singular value decomposition. Spring. Staff.

665 [235] IMAGES, GRAPHICS, AND VISION (3). Prerequisites, COMP 410 and MATH 383. Display devices and procedures. Scan conversion. Matrix algebra supporting viewing transformations in computer graphics. Basic differential geometry. Coordinate systems, Fourier analysis, FDFT algorithm. Human visual system, psychophysics, scale in vision. Fall. Pizer, Bishop, Brooks.

715 [215] VISUALIZATION IN THE SCIENCES (MTSC 715, PHYS 715) (3). Computational visualization applied in the natural sciences. For both computer science and natural science students. Available techniques and their characteristics, based on human perception, using software visualization toolkits. Project course. Fall. Taylor.

720 [240] COMPILERS (3). Prerequisites, COMP 455, 520, 524. Tools and techniques of compiler construction. Lexical, syntactic and semantic analysis. Emphasis on code generation and optimization. (Alternate years.) Prins.

721 [230] DATABASE MANAGEMENT SYSTEMS (3). Prerequisites, COMP 521, 550. Database management systems, implementation and theory. Query languages, query optimization, security, advanced physical storage methods and their analysis. (On demand.) Staff.

723 [204] SOFTWARE DESIGN AND IMPLEMENTATION (3). Prerequisites, COMP 524, 550. Principles and practices of software engineering. Object-oriented and functional approaches. Formal specification, implementation, verification and testing. Software design patterns. Practicum. Fall. Stotts, Dewan.

724 [244] PROGRAMMING LANGUAGES (3). Prerequisites, COMP 455, 520, 524. Selected topics in the design and implementation of modern programming languages. Formal semantics. Type theory. Inheritance. Design of virtual machines. Garbage collection. Principles of restructuring compilers. (On demand.) Prins.

730 [242] OPERATING SYSTEMS (3). Prerequisite, COMP 530. Theory, structuring and design of operating systems. Sequential and cooperating processes. Single processor, multiprocessor and distributed operating systems. Spring. Dewan, Jeffay, F. D. Smith, Mayer-Patel.

734 [243] DISTRIBUTED SYSTEMS (3). Prerequisite, COMP 431 or permission of the instructor. Design and implementation of distributed computing systems and services. Inter-process communication and protocols, naming and name resolution, security and authentication, scalability, high availability, replication, transactions, group communications, distributed storage systems. Fall. Dewan, Jeffay, F. D. Smith.

735 [247] DISTRIBUTED AND CONCURRENT ALGORITHMS (3). Prerequisites, COMP 633, 723. Verification of concurrent systems. Synchronization, mutual exclusion and related problems, barriers, rendezvous, nonblocking algorithms. Fault tolerance: consensus, Byzantine agreement, self-stabilization. Broadcast algorithms. Termination and deadlock detection. Clock synchronization. (Alternate years.) Anderson.

737 [232] REAL-TIME SYSTEMS (3). Prerequisite, COMP 530. Taxonomy and evolution of real-time systems. Timing constraints. Design, implementation and analysis of real-time systems. Theory of deterministic scheduling and resource allocation. Case studies and project. Spring. (Alternate years.) Jeffay, Anderson, Baruah.

740 [206] COMPUTER ARCHITECTURE AND IMPLEMENTATION (3). Prerequisites, COMP 411, PHYS 352. Architecture and implementation of modern single-processor computer systems. Performance measurement. Instruction set design. Pipelining. Instruction-level parallelism. Memory hierarchy. I/O system. Floating-point arithmetic. Case studies. Practicum. Fall. Bishop.

741 [261] ELEMENTS OF HARDWARE SYSTEMS (3). Prerequisite, COMP 411. Issues and practice of information processing hardware systems for computer scientists with little or no previous hardware background. System thinking, evaluating technology alternatives, basics of electronics, signals, sensors, noise and measurements. Spring. Bishop, Vicci.

744 [268] VLSI SYSTEMS DESIGN (3). Prerequisites, COMP 740, knowledge of digital logic techniques. Introduction to the design, implementation and realization of very large-scale integrated systems. Each student designs a complete digital circuit that will be fabricated and returned for testing and use. Spring. Hedlund.

750 [202] ALGORITHM ANALYSIS (3). Prerequisites, COMP 455, 550. Algorithm complexity. Lower bounds. The classes P, NP, PSPACE and co-NP; hard and complete problems. Pseudo-polynomial time algorithms. Advanced data structures. Graph-theoretic, number-theoretic, probabilistic and approximation algorithms. Fall. Anderson, Plaisted, Baruah, Snoeyink.

752 [282] MECHANIZED MATHEMATICAL INFERENCE (3). Prerequisite, COMP 825. Propositional calculus. Semantic tableaux. Davis-Putnam algorithm. Natural deduction. First-order logic. Completeness. Resolution. Problem representation. Abstraction. Equational systems and term rewriting. Specialized decision procedures. Nonresolution methods. (On demand.) Plaisted.

758 [288] INFORMATION THEORY (3).

759 [289] ERROR CORRECTING CODES (3).

761 [231] INTRODUCTORY COMPUTER GRAPHICS (1).

762 [233] DISCRETE EVENT SIMULATION (STOR 762) (3). Prerequisites, STAT 555 and OR 641, or the equivalent and familiarity with computer programming. Introduces students to modeling, programming and statistical concepts applicable to discrete event simulation on digital computers. Emphasizes statistical analysis of simulation output. Students model, program and run simulations. Fall. Tekin, Ziya.

763 [248] SEMANTICS AND PROGRAM CORRECTNESS (3). Prerequisite, COMP 724. Formal characterization of programs. Denotational semantics and fixed-point theories. Proof of program correctness and termination. Algebraic theories of abstract data types. Selected topics in the formalization of concurrent computation. (On demand.) Staff.

764 [252] MONTE CARLO METHOD (3). Prerequisites, MATH 233, 416, 418, STAT 435, COMP 110, or consent of the instructor. Relevant probability and statistics. General history. Variance reduction for sums and integrals. Solving linear and nonlinear equations. Random, pseudorandom generators; random trees. Sequential methods. Applications. (On demand.) Halton.

766 [257] VISUAL SOLID SHAPE (3). Prerequisites, MATH 233, 416. 3D differential geometry; local and global shape properties; visual aspects of surface shape. Taught largely through models and figures. Applicable to graphics, computer vision, human vision and biology. Fall. (Alternate years.) Pizer.

767 [258] GEOMETRIC AND SOLID MODELING (3). Prerequisites, COMP 575 or 770, and MATH 661. Curve and surface representations. Solid models. Constructive solid geometry and boundary representations. Robust and error-free geometric computations. Modeling with algebraic constraints. Applications to graphics, vision and robotics. (Alternate years.) Manocha.

768 [259] PHYSICALLY BASED MODELING AND SIMULATION (3). Prerequisites, COMP 665, or permission of the instructor. Geometric algorithms, computational methods, simulation techniques for modeling based on mechanics and its applications. (Alternate years.) Lin.

770 [236] COMPUTER GRAPHICS (3). Prerequisites, COMP 665, 761. Study of graphics hardware, software and applications. Data structures, graphics,

languages, curve surface and solid representations, mapping, ray tracing and radiosity. Spring. Bishop, Brooks, Fuchs, Lin, Manocha.

775 [254] IMAGE PROCESSING AND ANALYSIS (BMME 775) (3). Prerequisites, COMP 665, MATH 547 and STAT 435. Approaches to analysis of digital images. Scale geometry, statistical pattern recognition, optimization. Segmentation, registration, shape analysis. Applications, software tools. Spring. Gerig, Pizer.

776 [256] COMPUTER VISION IN OUR 3D WORLD (3). Prerequisites, MATH 416, 566, COMP 550, 665, 775, or permission of the instructor. Fundamental problems of computer vision. Projective geometry. Camera models, camera calibration. Shape from stereo, epipolar geometry. Photometric stereo. Optical flow, tracking, motion. Range finders, structured light. Object recognition. Fall. (Odd years.) Gerig, Welch.

785 [273] NEURAL NETWORKS (3).

787 [277] VISUAL PERCEPTION (3). Prerequisites, COMP 665 (vision segment), PSYC 730, or equivalent. Surveys form, motion, depth, scale, color, brightness, texture and shape perception. Includes computational modeling of vision, experimental methods in visual psychophysics and neurobiology, recent research and open questions. Fall. (Alternate years.) Pizer.

788 [275] EXPERT SYSTEMS (3). Prerequisite, COMP 750. Languages for knowledge engineering. Rules, semantic nets and frames. Knowledge acquisition. Default logics. Uncertainties. Neural networks. (On demand.) Plaisted.

790 [290] TOPICS IN COMPUTER SCIENCE (1–21). Prerequisite, permission of the instructor. This course has variable content and may be taken multiple times for credit. Fall and spring. Staff.

822 [286] TOPICS IN DISCRETE OPTIMIZATION (STOR 822) (3). Prerequisites, OR 712 and permission of the instructor. Topics may include polynomial algorithms, computational complexity, matching and matroid problems, and the traveling salesman problem. (Alternate years.) Provan.

824 [245] FUNCTIONAL PROGRAMMING (3). Prerequisite, COMP 524. Programming with functional or applicative languages. Lambda calculus; combinators; higher-order functions; infinite objects. Least fixed points, semantics, evaluation orders. Sequential and parallel execution models. (On demand.) Prins, Plaisted.

825 [246] LOGIC PROGRAMMING (3). Prerequisite, COMP 524. Propositional calculus, Horn clauses, first-order logic, resolution. Prolog: operational semantics, relationship to resolution, denotational semantics, and nonlogical features. Programming and applications. Selected advanced topics. (On demand.) Plaisted.

831 [241] INTERNET ARCHITECTURE AND PERFORMANCE (3). Prerequisite, COMP 431 or permission of the instructor. Internet structure and architecture; traffic characterization and analysis; errors and error recovery; congestion and congestion control; services and their implementations; unicast and multicast routing. Spring. (Alternate years.) Jeffay, F. D. Smith, Mayer-Patel.

832 [249] MULTIMEDIA NETWORKING (3). Prerequisites, COMP 431 and 530. Audio/video coding and compression techniques and standards. Media streaming and adaptation. Multicast routing, congestion and error control. Internet protocols RSVP, RTP/RTCP. Integrated and differentiated services architecture for the Internet. Jeffay, Mayer-Patel.

841 [265] ADVANCED COMPUTER ARCHITECTURE (3). Prerequisite, COMP 740. Concepts and evolution of computer architecture, machine language syntax and semantics; data representation; naming and addressing; arithmetic; control structures; concurrency; input-output systems and devices. Milestone architectures. (Alternate years.) Brooks.

842 [267] ADVANCED COMPUTER IMPLEMENTATION (3). Prerequisites, COMP 740, knowledge of digital logic techniques. The application of digital logic to the design of computer hardware. Storage and switching technologies. Mechanisms for addressing, arithmetic, logic, input/output and storage. Microprogrammed and hardwired control. (On demand.) Staff.

844 [269] ADVANCED DESIGN OF VLSI SYSTEMS (3). Prerequisite, COMP 744. Advanced topics in the design of digital MOS systems. Students design, implement and test a large custom integrated circuit. Projects emphasize the use of advanced computer-aided design tools. (Alternate years.) Staff.

850 [228] ADVANCED ANALYSIS OF ALGORITHMS (3). Prerequisite, COMP 750. Design and analysis of computer algorithms. Time and space complexity; absolute and asymptotic optimality. Algorithms for searching, sorting, sets, graphs and pattern-matching. NP-complete problems and provably intractable problems. (Alternate years.) Staff.

870 [238] ADVANCED IMAGE SYNTHESIS (3). Prerequisite, COMP 770. Advanced topics in rendering, including global illumination, surface models, shadings, graphics hardware, image-based rendering and antialiasing techniques. Topics from the current research literature. Fall. (Alternate years.) Lastra.

872 [239] EXPLORING VIRTUAL WORLDS (3). Prerequisite, COMP 870. Project course, lecture, and seminar on real-time interactive 3D graphics systems in which the user is "immersed" in and interacts with a simulated 3D environment. Hardware, modeling, applications, multi-user systems. (Alternate years.) Fuchs, Brooks.

875 [255] RECENT ADVANCES IN IMAGE ANALYSIS (3). Prerequisite, COMP 775. Lecture and seminar on recent advances in image segmentation, registration, pattern recognition, display, restoration and enhancement. Spring. (Even-numbered years.) Pizer, Gerig.

892 [395] PRACTICUM (0.5). Prerequisite, permission of the instructor. Work experience in an area of computer science relevant to the student's research interests and pre-approved by the instructor. The grade, pass or fail only, will depend on a written report by the student and on a written evaluation by the employer. Staff.

910 [220] COMPUTER SCIENCE MODULE (0.5–21).

911 [291] PROFESSIONAL WRITING IN COMPUTER SCIENCE (3). Prerequisite, graduate major in computer science. Analysis of good and bad writing. Exercises in organization and composition. Each student also writes a thesis-quality short technical report on a previously approved project. Fall and spring. Halton, J. B. Smith, Snoeyink, Weiss.

915 [321] TECHNICAL COMMUNICATION IN COMPUTER SCIENCE (1). Prerequisite, graduate major in computer science or permission of the instructor. Seminar on teaching, short oral presentations and writing in computer science. Spring. Weiss, Brooks.

916 [322] SEMINAR IN PROFESSIONAL PRACTICE (1). Prerequisite, satisfaction of M.S. Computer Science program product requirement. The role and responsibilities of the computer scientist in a corporate environment, as an entrepreneur and as a consultant. Professional ethics. (Alternate years.) Brooks.

917 [323] SEMINAR IN RESEARCH (1). Prerequisite, graduate major in computer science. The purposes, strategies and techniques for conducting research in computer science and related disciplines. (On demand.) Staff.

918 [310] RESEARCH ADMINISTRATION FOR SCIENTISTS (1). Prerequisite, graduate status. Introduction to grantsmanship, research grants and contracts, intellectual property, technology transfer, conflict of interest policies. Course project: grant application in NSF FastLane. Spring. Quigg.

980 [324] COMPUTERS AND SOCIETY (1). Prerequisite, graduate major in computer science. Seminar on social and economic effects of computers on such matters as privacy, employment, power shifts, rigidity, dehumanization, dependence, quality of life. (On demand.) Staff.

990 [390] RESEARCH SEMINAR IN COMPUTER SCIENCE (1–21). Prerequisite, permission of the instructor. Seminars in various topics offered by members of the faculty. Fall and spring. Staff.

991 [391] READING AND RESEARCH (1–21). Prerequisite, permission of the instructor. Directed reading and research in selected advanced topics. Fall and spring. Staff.

993 [393] MASTER'S THESIS (3–6). Prerequisite, permission of staff. Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Prerequisite, permission of staff. Fall and spring. Staff.

School of Dentistry

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JOHN N. WILLIAMS, *Dean*

Professors

Roland R. Arnold, Immunology, Host-Microbial Biology
James D. Beck, Oral Epidemiology
Lyndon Cooper, Bone Cell Physiology, Implantology
Terry Donovan, Dental Materials
Greg Essick, Dental Research Center
David A. Felton, Prosthodontics, Dental Implants, and Clinical Trials
H. Garland Hershey, Orthodontics
Harald Heymann, Operative Dentistry, Biomaterials
Ralph Leonard, Diagnostic Sciences and General Dentistry
John Ludlow, Oral and Maxillofacial Radiology
William Maixner, Neurobiology, Pain Perception and Modulation, Pain Management
Kenneth N. May Jr., Operative Dentistry
Frank T. McIver, Pediatric Dentistry
Valerie Murrah, Oral Carcinogenesis, Salivary Gland Malignancies
Steven Offenbacher, Inflammatory Mediators, Host Response, Periodontal, Systemic Diseases
Lauren Patton, Oral Medicine, Dental Ecology
Luis Pimenta, Dental Ecology
Ceib Phillips, Orthodontics
William R. Proffit, Orthodontics
Michael Roberts, Pediatric Dentistry, Dental Lasers
Daniel A. Shugars, Health Services Research
John W. Stamm, Oral Epidemiology
Ronald P. Strauss, Medical Sociology and Health Promotion/Disease Prevention
Edward J. Swift, Dental Materials
J. F. Camilla Tulloch, Orthodontics
Timothy Turvey, Consequences of Craniofacial and Maxillofacial Surgery
Donald A. Tyndall, Oral and Maxillofacial Radiology
William F. Vann Jr., Pediatric Dentistry
Donald W. Warren, Craniofacial Development and Dysfunction
Raymond P. White Jr., Oral Surgery Therapies
Aldridge Wilder, Clinical and Laboratory Dental Materials Research
Ray C. Williams, Periodontology, Clinical Trials
J. Tim Wright, Mineralization and Development, Genetic Disorders
Mitsuo Yamauchi, Collagen Biochemistry, Physiology and Metabolism of Bone

Associate Professors

Silvana Barros, Periodontology
Alice Curran, Oral Pathology
Diane H. Dilley, Pediatric Dentistry
Richard Eidson, Operative Dentistry
Eric Everett, Genetic Disorders
Patrick Flood, Cellular Immunology, Immune Response and Regulation
Mary George, Dental Ecology
Geroge Gerdts, Diagnostic Sciences and General Dentistry
Albert Guckes, Prosthodontics
Janet Guthmiller, Associate Dean for Academic Affairs, Periodontology
Ching-Chang Ko, Orthodontics
Lorne D. Koroluk, Pediatric Dentistry and Orthodontics
Mark Kutcher, Oral Medicine
Jessica Lee, Pediatric Dentistry
Sally Mauriello, Radiology, Geriatric Dentistry
Michael Milano, Pediatric Dentistry
Glenn E. Minsley, Prosthodontics
Antonio Morietti, Periodontology
William Murdock, Diagnostic Sciences and General Dentistry
Samuel Nesbit, Diagnostic Sciences and General Dentistry
David W. Paquette, Periodontology, Clinical Trials
Andre Ritter, Operative Dentistry
Eric Rivera, Endodontics
Rose Sheats, Orthodontics
Douglas Solow, Diagnostic Sciences and General Dentistry
Margot Stein, Dental Ecology
Diane Shugars, HIV and AIDS Pathogenesis, Virus-Host Cell Interactions
Aurel Strat, Periodontology
John Sturdevant, Operative Dentistry
E. Leland Webb, Prosthodontics
Rebecca S. Wilder, Dental Hygiene
David Zajac, Craniofacial Disorders
Jennifer Webster-Cyriaque, Oral Medicine, Dental Ecology
Thomas Ziemiecki, Prosthodontics

Assistant Professors

Eric Bare, Endodontics
Lee Bushell, Operative Dentistry
Lucia Cevidanes, Orthodontics
Ingeborg Dekok, Prosthodontics
Lynn Fox, Dental Ecology
Sylvia Frazier-Bowers, Orthodontics
Glenn Garland, Diagnostic Sciences and General Dentistry
James M. George, Computer Technologies
Matthew Hopfensperger, Prosthodontics
Andre Mol, Oral and Maxillofacial Radiology
Salvadore Nares, Periodontology, Immunology
Andrea Neely, Endodontics
Ricardo Padilla, Diagnostic Sciences and General Dentistry
Patricia Pereira, Operative Dentistry
Janet Southerland, Diabetics and Periodontal Disease
Lynn Smith, Dental Ecology
Ricardo Walter, Operative Dentistry
Shitzuko Yamauchi, Endodontics

Clinical Associate Professors

George H. Blakey, Oral and Maxillofacial Surgery, Anesthesia
Charles F. Brantley, Advanced General Dentistry
Jan Faulk-Eggleston, Oral and Maxillofacial Surgery
Burrell E. Kanoy Jr., Prosthodontics
Charlotte Peterson, Dental Hygiene Education
Vickie P. Overman, Dental Hygiene
Enrique Platin, Oral and Maxillofacial Radiology
Glenn Reside, Oral and Maxillofacial Surgery
Allen Samuelson, Dental Ecology
Zhengyan Wang, Pediatric Dentistry

Clinical Assistant Professors

Nadine Brodala, Periodontology, Dental Implants
Rocio Quinonez, Pediatric Dentistry
Sal Nares, Periodontology
Karen Tiwana, Urgent Care

Research Professor

James D. Bader, Health Services Research

Research Associate Professor

Luda Diatchenko, Pain Genetics and Molecular Biology

Research Assistant Professors
Sompop Bencharit, Prosthodontics
Heather Jared, Dental Ecology
Pei Lim, Dental Research
Yoshiyuki Mochida, Bone Research
Preeda Pungpapong, Prosthodontics
Stuart Rennie, Dental Ecology

Professors Emeriti
James Bawden
Marvin Block
Kent W. Healey
Phillip Hirsch
Malcolm Johnston
Charles Milone
Donald W. Warren
Roy Peach

Graduate instruction in the School of Dentistry is offered in endodontics, operative dentistry, oral biology, oral and maxillofacial pathology, oral and maxillofacial radiology, orthodontics, pediatric dentistry, periodontology, prosthodontics and dental hygiene education, and is designed to prepare dentists and dental hygienists for teaching, research or specialty practice. All dental graduate programs leading to the master of science degree require the successful completion of oral and/or written comprehensive examinations, a research project and a thesis. Consideration has been given to the requirements as set forth by the Commission on Dental Accreditation of the American Dental Association and the respective specialty boards. The Oral Biology Program leads to the Ph.D. degree.

Graduates who possess an appropriate degree and who meet the requirements of The Graduate School are considered for admission. For some programs, scores on the Graduate Record Examination (GRE) must be submitted for an applicant to be considered for admission.

Enrollment for study in dental specialty programs requires a minimum period of residency of three years. The curricula have been designed to permit maximum flexibility in preparation for practice, teaching or research, as well as to meet the educational requirements of the specialty boards. The Dental Hygiene Education Program is two years long. The Oral Biology Ph.D. Program requires four or more years to complete.

In addition to the courses listed herein, an appreciable number of elective courses are offered. The degree requirements vary slightly with each program. Detailed curricula requirements may be obtained by visiting the School of Dentistry's Web site at www.dent.unc.edu.

Tuition and Fees

Semester tuition and fees for residents total $3,500. The summer rate is $620. Instruments, books and laboratory fees are to be determined. Nonresident tuition and fees total $10,500 per semester and $2,250 for the summer term. Tuition and fees are due at the time of registration.

Student loans are available on the same basis as for undergraduates. For additional information, write the Office of Admissions, The University of North Carolina at Chapel Hill, School of Dentistry.

Core and Multiuse Courses Offered to Graduate Students in Dentistry

701 [201] (DENG) INTRODUCTION TO RESEARCH DESIGN (1). Introduction to scientific methodology, clinical epidemiology, oral biology and technology transfer, clinical trials, evaluation of scientific literature, experiments of nature, animal models for oral research, ethnics in research, laboratory simulations and research models, and proposal writing. Fall. Wright.

701ab [301ab] (DENG) INTERDISCIPLINARY CARE CONFERENCE I (1, 1). For first-year dental graduate students. Review and discussion of the diagnoses, treatment plans, prognoses and interdisciplinary care of selected patients. Fall and spring. Brantley, Levin.

702 [202] (DENG) BIOSTATISTICS (2). Introduction of biostatistical concepts, sampling, descriptive statistics, hypothesis testing, comparisons of means and proportions, 2x2 and r x c tables, correlation and simple regression, sample size and power, analysis of variance, factorial anova, multiple regression and nonparametric tests. Spring. Phillips.

702ab [302ab] (DENG) INTERDISCIPLINARY CARE CONFERENCE II (1, 1). For second-year dental graduate students. Review and discussion of the diagnoses, treatment plans, prognoses and interdisciplinary care of selected patients. Fall and spring. Brantley, Levin.

703 [203] (DENG) APPLIED DENTAL RESEARCH METHODS (2). Prerequisites, DENG 701 and DENG 702, or equivalent. Evaluate research methods used in basic, clinical, laboratory, behavioral and epidemiological research in oral health and encountered in the dental literature. Master's thesis protocols completed by class participants are the basis of most seminar discussions. Fall. Beck.

706 [206] (ORAD) ADVANCED ORAL RADIOLOGY (2). Radiographic selection criteria, efficacy of dental radiographs, panoramic radiology, extraoral techniques, radiation risks and radiological hygiene in dental practice, principle of radiologic interpretation, radiology of cysts and tumors, radiology of the TMJ, radiology of systemic disease, quality improvement, radiology for dental implants, digital imaging in dentistry and advanced imaging of the craniofacial region. Spring. Tyndall.

707 [207] (OMSU) REGIONAL ANATOMY (3). Review of the anatomy of the head and neck region, including osteology, cardiovascular system, head and neck embryology, special sensory modalities, nervous system, functional nervous system and extraoral correlation with the oral cavity. Summer. Kernick.

720 [220] (OMSU) CLINICAL PHARMACOLOGY AND THERAPEUTICS (1). Covers compliance, substance abuse, antibiotic considerations, cardiology issues in dental practice, clinical pharmacology of relevant reactions and interactions of medications encountered in dental practice, dental prescribing and general considerations in pediatrics, pain management and oral manifestations associated with selected medications. Summer. Eckel.

720 [320] (PERI) CASE ANALYSIS (1). This graduate seminar traces the biology of osseointegration, surgical techniques in dental implant placement, and prosthetic restoration. The seminar includes didactic lectures, case presentations and journal club components. Fall. Brodala.

721 [321] (PERI) CASE ANALYSIS (1). This graduate seminar continues themes introduced in PERI 720 and discusses advanced implant topics including bone augmentation, peri-implantitis and implant efficacy assessment. The seminar includes didactic lectures, case presentations and journal club components. Spring. Brodala.

750 [250] (DENG) ORAL-FACIAL COMMUNICATIVE DISORDERS (1). This course provides an overview of a multidiscipline approach to the clinical management of children with oral, facial and communicative disorders. Spring. Dilley and craniofacial team.

751 [251] (OMSU) ADVANCED PAIN AND ANXIETY CONTROL (2). Introduction to operating room and recovery room protocol; patient cardiovascular and pulmonary evaluation; adjunct and inhalant agents; nitrous oxide; pharmacology of IV anesthetic agents; EKG interpretation; arterial blood gases; anesthesia equipment monitoring; anesthetic complications and emergencies; fluid and electrolyte and blood therapy; airway management; venipuncture; pediatric anesthesia; and pre-op evaluation, orders and rounds. Spring. Roberts.

762 [262] (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). Fall topics include developmental disturbances of soft and hard tissues, syndromes, inflammation, immunology, pulp and periapical disease, periodontal

disease, tumor-like proliferations, microbial disease, endocrine and metabolic diseases. Spring topics include odontogenic cysts, salivary gland disease, oral epithelial and mesenchymal neoplasms, bone and joint diseases, nerve and muscle diseases, dermatological diseases and blood diseases. Fall and spring. Curran.

763 [263] (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). Continuation of ORPA 762. Spring. Curran.

Oral Biology

Program objectives are to train individuals for careers in research and teaching in areas related to oral biology. Ph.D. graduates will have the qualifications and research expertise to become productive faculty members at leading universities and senior scientists in various academic institutions or industrial settings.

Oral biology encompasses the study of the structure and function of normal and abnormal tissues of the oral cavity and related areas, as well as the study of disease and healing mechanisms specific to various oral conditions. The discipline of oral biology applies and extends the concepts of immunology, embryology, physiology, cellular and molecular biology, neurobiology, pharmacology, microbiology and biochemistry to understanding the growth and development and pathologies associated with the oral cavity. Attention in dental research and practice is now focusing on the dynamics of oral disease and prevention and treatment at the earliest stages of development, including research on risk factors for disease as well as the cellular and molecular events in disease pathogenesis. Molecular approaches for oral disease analysis and the complexity of disease elements require advanced training in the discipline of oral biology. Modern biomedical research is also identifying systemic relationship between oral conditions, health status and diseases such as atherosclerosis, HIV and cancer; the oral cavity also offers an ideal model to study biological structures and cellular mechanisms important throughout the body and important in immune response.

The UNC-Chapel Hill Oral Biology Ph.D. Program has three primary areas of emphasis: orofacial neurobiology, microbial pathogenesis and the biology of extracellular matrices. These areas represent central concepts for study at advanced levels in the discipline of oral biology. Expertise and authority in these particular concepts are well represented within the strongest research and training qualifications of program faculty. Curricular requirements are based on training areas, with common core requirements for all students. Students begin with an emphasis on basic sciences courses (cell biology and anatomy, microbiology, biochemistry) followed by examination of specific biological applications. Research interests and qualifications (such as a D.D.S. or an M.D.) will also determine course requirements. Participation in research in progress is a key element of the program, and students start laboratory rotations during their first semester to allow maximum time for research involvement. Program participants will be involved early in their academic careers with certain of key research areas targeted by the National Institutes of Health for national scientific focus. In addition, UNC-Chapel Hill's proximity and access to the Research Triangle's unique blend of universities, private industry and national scientific organizations offer a wealth of resources for scientific study, collaboration and research development.

Dual Degree Program in Oral Biology and Doctor of Dental Surgery (D.D.S.)

There is an opportunity for students who have an interest in pursuing both a Ph.D. degree in oral biology with The Graduate School to simultaneously pursue a doctor of dental surgery (D.D.S.) degree in the School of Dentistry. This special program is a seven-year program that allows the pursuit of both degrees simultaneously, and results in awarding of both the Ph.D. and the D.D.S. degree upon completion of the requirements for both programs.

Applying for this dual degree program is an option when applying for either the Oral Biology Graduate Program or for the D.D.S. Program in the School of Dentistry. The applicant must indicate an interest in pursuing the dual degree program at the time of application, and will be interviewed and accepted into the program as a dual degree student. The application deadline for this dual degree program is November 1 (the deadline for the D.D.S. program). Students applying for the dual degree program must take either the Graduate Record Examination (GRE) OR the Dental Aptitude Test (DAT), but are not required to take both exams. All other requirements for application to the dual degree program are identical to the application process for the Oral Biology Graduate Program. Students not chosen to enter the dual degree program would still be eligible for admittance into either the D.D.S. Program or the Oral Biology Graduate Program through the regular application process.

Students accepted into the dual degree program will follow a specialized curriculum, which combines scientific and clinical training with research activities designed to promote a career in academic dentistry. The first three years of the program will consist of basic didactic courses from both programs coupled with laboratory experiences, followed by a four year period of dissertation research concurrent with comprehensive clinical care education. Students who successfully complete the program will then be awarded both the Ph.D. and D.D.S. degrees at the completion of the requirements for both degrees. Students who are not eligible or who choose not to complete both programs but rather pursue only the D.D.S. degree must apply to the D.D.S. program and be accepted through the regular application process.

The Faculty and Their Research

Orofacial Neurobiology: Greg Essick, somatosensory and motor research; Mark Hollins, somatosensory and motor research; William Maixner, neurobiology, pain perception; Aldo Rustioni, neurophysiology; Luda Diatchenko, genetic background for individual variation in pain sensitivity and development of chronic pain conditions.

Pathogenesis: Roland R. Arnold, immunology, host-microbial biology, secretory immunity; Steven L. Bachenheimer, molecular pathology of herpes simplex virus; Miriam Braunstein, microbial genetics; Patrick M. Flood, cellular immunology, immune response and regulation; Robert E. Johnston, viral pathogenesis; Thomas Kawula, bacterial pathogenesis; Glenn Matsushima, neuroimmunology; Salvatore Nares, mucosal immunology; Steven Offenbacher, inflammatory mediators, host response, periodontal and systemic diseases; Nancy Raab-Traub, pathogenesis of Epstein-Barr virus; Diane C. Shugars, human immunodeficiency viruses and AIDS pathogenesis, virus-host cell interactions; Christina Teng, human lactoferrin structure and function; Jenny Ting, molecular immunology, neuroimmunology, gene regulation; Roland Tisch, immunology and diabetes; Jennifer Webster-Cyriaque, oral manifestations of systemic disease, host-virus interactions.

Biology of Extracellular Matrices: Lyndon Cooper, bone cell physiology, implantology; Wagner Duarte, physiology and metabolism of bone; Leslie Parise, integrin cytoplasmic domain binding proteins; Eric Everett, Genetics of acquired and congenital disorders of craniofacial development; Sylvia Frazier-Bowers, genetics; Patricia Pereira, biomaterials; Lola Reid, stem cell differentiation and extracellular matrix

interactions; Kenneth Tomer, application of mass spectrometry to protein characterization, determination of posttranslational modifications of proteins; John Timothy Wright, mineralization and development, genetic disorders, extracellular matrices; Mitsuo Yamauchi, collagen biochemistry, physiology and metabolism of bone; Heathe Yeowell, protein processing, post-translational, gene expression regulation, connective tissue diseases.

Research Facilities

The Oral Biology Graduate Program is located in the Dental Research Center, the central base for much of the basic science research in the School of Dentistry, with access to SEM/TEM microscopy, tissue culture facilities, anaerobic microbiology support, ALAC-accredited animal facilities, a P-3 level isolation facility, atomic absorption spectrophotometry, computers and software for image analyses/enhancement and finite element analyses, and a Clinical Research Unit, which includes an eight-patient operatory. Biostatistical assistance is readily available as well as medical illustration, photography, radiology and grants management.

Financial Aid

Graduate research assistantships are awarded competitively for students accepted for the Oral Biology Ph.D. Program. These competitive assistantships provide support through program resources during the first two years with health insurance, and may include a special tuition rate for out-of-state students. Support for dissertation research (beginning in the student's third year) is made available by faculty mentors.

Applying

Individuals with significant background in basic sciences and/or dentistry and medicine who are interested in developing research skills and focus and studying current issues in oral biology are encouraged to apply. Students who wish to study for the Ph.D. degree receive preference. Research experience is an asset and a statement of research interests is desirable. Applications are accepted for admission to the fall session, and are preferred by January 31. Application requirements include the Graduate Record Examination (GRE) and, for foreign applicants, the Test of English as a Foreign Language (TOEFL), documentation of previous scientific or medical studies and transcripts for all undergraduate and graduate education. Candidates will be selected on a competitive basis by faculty of the Oral Biology Program serving on a selection committee. Candidates' research interests, research qualifications and appropriate opportunities will be significant factors in selection.

Correspondence and Information

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Graduate Courses in Oral Biology

701, 702, 703, 704 [209abcd] (OBIO) RESEARCH TECHNIQUES IN ORAL BIOLOGY (6). Prerequisite, approval of the instructor. The course familiarizes participants with a selection of specialized research techniques employed in interdisciplinary basic science approaches to problems in oral biology. Four lecture laboratory hours a week. Spring and summer. Flood.

710, 711, 712, 713 [208abcd] (OBIO) DISCUSSION IN ORAL BIOLOGY (2). Prerequisite, approval of the instructor. A series of seminars on topics relevant to research and scientific knowledge in the field of oral biology. Visiting scientists from other research centers in the country and abroad participate in the discussion series. One lecture hour a week. Fall and spring. Flood.

720 [233] (OBIO) ADVANCED ORAL BIOLOGY (3, 2). Significant developments and trends in basic medical sciences that have applications in specialized dentistry are discussed. Recent publications taken from medical and dental scientific literature are discussed. Three hours a week. Summer. Cooper.

721, 722, 723, 724 [234abcd] (OBIO) DIRECTED STUDIES IN ORAL BIOLOGY (2). Topics include extracellular matrices, immunology, inflammation, neurobiology and pain management. Fall and spring. Arnold.

730, 731, 732 [249abc] (OBIO) BIOLOGICAL CONCEPTS (3). Overview of structures and biological determinants of conditions and diseases of the oral cavity. Both growth and development and pathophysiology will be introduced in the context of three areas of oral biology: biology of extracellular matrices, host-pathogens interactions and orofacial neurobiology. Fall. Faculty on staff.

740 [250] (OBIO) EXTRACELLULAR MATRICES (3). Introduction to structures and biological functions of major extracellular matrix components, their interactions with cells, chemistry and biology of mineralized tissues, and biological and molecular aspects of connective tissue disorders. Lectures, discussions. Fall. Yamauchi.

741 [260] (OBIO) THE MOLECULAR CONTROL OF BONE MASS (2). This course will examine bone formation and bone maintenance. Cellular and molecular determinants of osteogenesis and resorption will be explored. Course format will be faculty lecture and assigned student presentation of current literature. Cooper.

750 [251] (OBIO) OROFACIAL NEUROBIOLOGY (3). An overview of normal human orofacial sensation and function, evaluation of orofacial sensory and motor capacities, orofacial pain mechanisms and neural control of orofacial behaviors. Lectures, literature review, discussions and seminars. Spring. Essick.

760 [252] (OBIO) HOST-PATHOGEN INTERACTIONS (3). Overview of basic etiology of pathogens and associated medical conditions, immune factors, immune response and oral microbiology/immunology, with emphasis on infectious disease processes and innate defense factors. Lectures, discussions. Spring. Flood.

761, 762 [280ab] (OBIO) THE MOLECULAR AND CELLULAR PATHOGENESIS OF INFLAMMATORY DISEASES (6). Prerequisites, biochemistry and immunology, permission of the instructor. Course presents recent information on the pathogenesis of inflammatory conditions from the molecular, cellular and systems perspectives. The two-semester course covers molecular signals, cellular processes, pathogenesis of specific inflammatory conditions and the immunopharmacology of inflammation. Lecture, seminar. Fall (a) and spring (b). Oral Biology faculty. (Course director: Offenbacher.)

770, 771, 772, 773 [259abcd] (OBIO) SELECTED TOPICS IN ORAL BIOLOGY (1). Review of current findings in selected areas of oral biology. Students will critique current literature dealing with the newest discoveries in neuroscience, inflammation or pathogenesis in an interactive forum between students and faculty. Flood.

780 [270] (OBIO) INTRODUCTION TO SCIENTIFIC WRITING (1). Seminar series that will give generic instructions covering grant writing skills and structure, as well as offer insight for scientific writing. Flood.

993 [393] (OBIO) MASTER'S THESIS (0–6). Prerequisite, permission of the staff. Faculty on staff.

994 [394] (OBIO) DOCTORAL DISSERTATION (0–6). Prerequisite, permission of the staff. Faculty on staff.

Oral and Maxillofacial Pathology

The Advanced Dental Education Program in Oral and Maxillofacial Pathology prepares qualified oral and maxillofacial specialists for positions of responsibility in institutions of higher dental education, research, or in private practice. Students develop competence in surgical oral pathology, acquire skills in the clinical management of patients with disorders of the head and neck, gain experience in pathology laboratory management, and develop teaching and research skills for enhancement of an academic career. Upon completion of the necessary requirements, each student is eligible for fellowship in the American Academy of Oral and Maxillofacial Pathology and certification by the American Board of Oral and Maxillofacial Pathology.

711, 721, 731 [212abc] (ORPA) SURGICAL ORAL PATHOLOGY SEMINAR I (1). This weekly seminar uses unknown cases as the basis for discussion of a variety of biopsy specimens taken from the head and neck. Clinical management of cases also is discussed. Students will develop skills for interacting with their medical and dental colleagues. Summer, fall and spring (first year). Murrah.

712, 722, 732 [232abc] (ORPA) CURRENT PERSPECTIVES ON ORAL AND MAXILLOFACIAL PATHOLOGY I (1). This seminar series will focus on current research in oral and maxillofacial pathology (OMP) and related fields. Current scientific literature will be critically reviewed. In addition, students will review historical literature to gain a perspective on the development of OMP as a specialty. Summer, fall and spring (first year). Padilla.

713, 723, 733 [202abc] (ORPA) ADVANCED ORAL PATHOLOGY I (1). This lecture and clinicopathologic correlation series includes study of the etiology, pathogenesis, clinical and histopathologic aspects of diseases of the head and neck. Summer, fall and spring (first year). Curran.

750 (ORPA) SURGICAL PATHOLOGY IN THE HOSPITAL SETTING (1-3).strong Under the supervision of the hospital pathologists, the student will rotate in anatomic pathology, laboratory medicine, dermatopathology, hematopathology, molecular medicine, surgical specialties, and other elective areas to develop advanced concepts of disease as well as a working relationship with medical colleagues. (Second year.) Bouldin.

762 [262] (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). This series of clinicopathologic correlation conferences will provide an opportunity to apply basic principles of oral pathology in the clinical setting and to develop a broader understanding of disease processes through histopathologic evaluation. Emphasis will be on the development of differential diagnoses, management of oral lesions and correlation of clinical findings and histopathologic features. Development of a working relationship between the oral pathologist and the specialist will also be emphasized. Fall. Curran.

763 [263] (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). Continuation of ORPA 762. Spring. Curran.

811, 821, 831 [214abc] (ORPA) SURGICAL ORAL PATHOLOGY SEMINAR III (1). Continuation of ORPA 731. Summer, fall, and spring (third year). Padilla.

812, 822, 832 [234abc] (ORPA) CURRENT PERSPECTIVES ON ORAL AND MAXILLOFACIAL PATHOLOGY III (1). Continuation of ORPA 732. Summer, fall and spring (third year). Curran.

813, 823, 833 [204abc] (ORPA) ADVANCED ORAL PATHOLOGY III (1). Continuation of ORPA 702. Summer, fall, and spring (third year). Murrah.

901 [301] (ORPA) RESEARCH. Under the guidance of the faculty, the student will select a research topic, review the literature, develop a protocol and present a preliminary proposal for an approved research project. Spring (first year). Curran.

993 [393] (ORPA) MASTER'S THESIS (3).

713 [213] (PATH) MECHANISMS OF DISEASE (1).

Oral and Maxillofacial Surgery

The graduate curriculum in Oral and Maxillofacial Surgery consists of a study of the basic biological sciences and clinical experience integrated with a progressively graduated four-year sequence of approved hospital experience. This flexible program is designed to 1) prepare dentists for a career in teaching, research, and/or practice in the specialty of oral and maxillofacial surgery, 2) meet the requirements for approval by the Commission on Dental Education of the American Dental Association and 3) prepare candidates for certification by the American Board of Oral and Maxillofacial Surgery.

While the study of the comprehensive biological sciences is integrated and stressed throughout the four years, the more formally structured courses are emphasized during the first two years of residency. More time is spent in seminars and independent study during the junior and senior residency years (third and fourth years). The latter allows flexibility for investigative study and additional rotations through various hospital services, and for additional elective assignments to provide more in-depth experience and knowledge related to oral and maxillofacial surgery.

All students are required to complete the full four-year program, including the prescribed formal courses, seminars, independent study and original research project. One program option is to earn the degree of master of science in dentistry (oral and maxillofacial surgery) by submission of a thesis.

Other optional courses of study for selected individuals in this program may include qualifying for an M.D. degree or a Ph.D. in a biological science. This involves an extended period of time that is individualized for each qualified student pursuing these additional studies.

Admission to The Graduate School for the study of oral and maxillofacial surgery is accomplished only after the appropriate committees review the application, transcripts and other credentials.

Graduate Courses in Oral and Maxillofacial Surgery

707 [207] (OMSU) REGIONAL ANATOMY (2 or more). Lecture, laboratory. Montgomery.

712abc [212abc] (OMSU) ORAL AND MAXILLOFACIAL SURGERY—ADVANCED ORAL AND MAXILLOFACIAL SURGERY (12). Faculty on staff (Dental School and UNC Hospitals).

714abc [214abc] (OMSU) ORAL AND MAXILLOFACIAL SURGERY—GENERAL ANESTHESIA (6). (UNC Hospitals.) Faculty on staff.

715abc [215abc] (OMSU) ORAL AND MAXILLOFACIAL SURGERY—PHYSICAL DIAGNOSIS (12). (UNC Hospitals.) Faculty on staff.

720 [220] APPLIED PHARMACOLOGY (1).

730 [230] (OMSU) ORAL AND MAXILLOFACIAL SURGERY—BASIC SURGICAL SKILLS (4). (UNC Hospitals.) This course includes an experimental animal surgery laboratory portion, as well as lectures and demonstrations of surgical principles and techniques. Faculty on staff.

740 [240] ORAL AND MAXILLOFACIAL RADIOLOGY (1).

760A [260A] ORAL AND MAXILLOFACIAL SURGERY I (1).

760B [760B] ORAL AND MAXILLOFACIAL SURGERY II (1).

762 [262] (ORPA) ORAL PATHOLOGY AND HISTOPATHOLOGY I (1). Fall. Murrah.

763 [263] (ORPA) ORAL PATHOLOGY AND HISTOPATHOLOGY II (2). Spring. Murrah.

801 (301)(OMSU) RESEARCH (6). To be arranged.

820 [320] (PERI) INTRODUCTION TO DENTAL IMPLANTS (1). Lectures and seminars on use of dental implants. Fall. Moriarty.

993 [393] (OMSU) THESIS (3 or more).

Operative Dentistry

The Department of Operative Dentistry offers a three-year program leading to an M.S. degree granted by the UNC-Chapel Hill Graduate School. The program involves component areas of research, teaching and patient care. The curriculum includes 1) general core courses including topics in basic and clinical sciences, 2) courses in educational sciences, 3) a research component including courses on research design and statistical methods and 4) a clinical component in contemporary operative dentistry. A formal thesis based on a selected research topic will be required, including its defense before an examining committee. The UNC-Chapel Hill Graduate School also requires a comprehensive written examination.

The admission policy for graduate training in operative dentistry follows the regular requirements for admission to The Graduate School. Admission to The Graduate School is granted only after the department reviews and approves the application, transcript of prior academic work, letters of reference and other credentials. All applications, transcripts and letters of reference should be mailed to the Dental Admissions Office, School of Dentistry, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599. All application materials should be submitted by December 1 for the following summer class.

Students begin the program July 1. The number of students is limited to two each year.

Graduate Courses in Operative Dentistry

701a [201a] (OPER) OPERATIVE DENTISTRY SEMINAR I (1). This course is an intensive review of the basic principles of operative dentistry, cariology and treatment planning; thus, it provides a foundation for all other courses in operative dentistry. The core text for this review is Sturdevant's Art and Science of Operative Dentistry.

701b [201b] (OPER) OPERATIVE DENTISTRY SEMINAR II (1). (Aesthetic and Adhesive Dentistry.) In this seminar, graduate students will learn the scientific principles and clinical techniques involved in dental aesthetics and adhesive restorations. Students may be required to develop a case presentation for this seminar.

701c [201c] (OPER) OPERATIVE DENTISTRY SEMINAR III (1). (Topics in Operative Dentistry.) A review of selected topics in operative dentistry, including biomaterials, clinical research and aesthetic dentistry.

702abcd [202abcd] (OPER) OPERATIVE LITERATURE REVIEW I (1). This is a weekly seminar offering a forum for presentation and discussion of relevant scientific papers on various operative dentistry related topics. Typically, a resident or faculty member presents one or more relevant papers, which is followed by a critical analysis of the study and discussion of the topic.

704a [204a] (OPER) OPERATIVE CLINICAL SEMINAR A (1). This seminar will involve a series of presentations where the student will present clinical cases resolved in the graduate clinic.

704b [204b] (OPER) OPERATIVE CLINICAL SEMINAR B (1). Continuation of Operative Clinical Seminar A course, involving a series of presentations where the student will present clinical cases resolved in the graduate clinic.

736A [236A] (OPER) GRADUATE DENTAL BIOMATERIALS I (3).

736B [236B] (OPER) GRADUATE DENTAL BIOMATERIALS II (3).

737 [237] (OPER) LAB RESEARCH METHODS (3).

738 [238] (OPER) CLINICAL RESEARCH METHODS (3).

790a [290a] (OPER) OPERATIVE DENTISTRY CLINIC I (1). Basic operative dentistry treatment planning and procedures.

790b [290b] (OPER) OPERATIVE DENTISTRY CLINIC II (4). (Patient treatment.) Primary focus is on patients requiring more advanced considerations for operative dentistry treatment planning and/or procedures. There will be a strong focus on aesthetic dentistry, prevention and "medical management" of caries, and the use of advanced technologies to provide operative dentistry treatment.

790c [290c] (OPER) OPERATIVE DENTISTRY CLINIC III (4). Continuation of Operative Dentistry Clinic II.

790d [290d] (OPER) OPERATIVE DENTISTRY CLINIC IV (3). Continuation of Operative Dentistry Clinic III.

790e [290e] (OPER) OPERATIVE DENTISTRY CLINIC V (4). Continuation of Operative Dentistry Clinic IV.

790f [290f] (OPER) OPERATIVE DENTISTRY CLINIC VI (4). Continuation of Operative Dentistry Clinic V.

790g [290g] (OPER) OPERATIVE DENTISTRY CLINIC VII (3). Continuation of Operative Dentistry Clinic VI.

903a [203a] (OPER) OPERATIVE DENTISTRY RESEARCH I (1). (Thesis related.) This course is provided on an individual basis by the student's thesis mentor. The student will develop and write a detailed description of materials and methods used in his or her research project.

903b [203b] (OPER) OPERATIVE DENTISTRY RESEARCH II (2). (Thesis Materials and Methods.) Student will perform a research project and obtain data for the master's thesis.

993 [393] (OPER) OPERATIVE DENTISTRY THESIS (3). The student will begin writing a master's thesis.

Oral and Maxillofacial Radiology

The Advanced Education Program in Oral and Maxillofacial Radiology begins on July 1 of each year and extends for three years, leading to a master of science degree. The purpose of the program is to prepare qualified oral and maxillofacial radiology specialists to function in institutions of higher dental education, research and clinical practice. The program prepares individuals to participate in maxillofacial radiological practice, provides background information on imaging physics, radiation physics, radiation biology and radiation protection, and offers teacher training preparation. Each student participates in an extensive research project for the thesis, as well as in several smaller department-based projects.

Each graduate student and his or her faculty advisor develops an original clinical or applied research project that is an integral part of the graduate program. A written thesis is required. The program meets the eligibility requirements of the American Dental Association for certification as an oral and maxillofacial radiologist.

Applications should be submitted by January 15. Interviews are usually scheduled before final acceptance.

Graduate Courses in Oral Radiology

585 [085] (RADI) RADIOLOGICAL HEALTH PHYSICS (3). Spring. Plott.

662 [162] (RADI) RADIOGRAPHIC IMAGING (4). Fall. Burns.

702 [202] (ORAD) ADVANCED ORAL RADIOLOGIC TECHNOLOGY (4). Seminars, laboratory and clinical sessions to provide experience in advanced oral radiologic procedures. Spring. Platin.

704 [204] (ORAD) ADVANCED RADIOLOGIC DIAGNOSIS II (3). Literature review, seminars and clinical experience in advanced radiologic diagnosis. Summer. Ludlow.

705 [205] (ORAD) PRINCIPLES FOR ADVANCED DIAGNOSTIC AND THERAPEUTIC RADIOLOGY (4). Literature review and seminars in the application of radiologic procedures such as computed tomography, digital imaging and magnetic resonance for diagnosis of oral and maxillofacial conditions. Fundamentals of radiation therapy are also included. Tyndall.

706 [206] (ORAD) ADVANCED ORAL RADIOLOGY (2). Lecture, seminars and clinical demonstrations in advanced radiology topics. This is designed primarily for master's degree students in advanced dental education graduate and specialty programs. Spring. Tyndall.

707 [207] (ORAD) GRADUATE CLINICAL ORAL RADIOLOGY (3). Fall, spring and summer (first year); summer, fall and spring (second year). Tyndall.

802 [302] (ORAD) CLINICAL RADIOLOGY CONFERENCE (1). Case studies in the interpretation of unusual conditions of the oral and maxillofacial region. Fall, spring and summer (first year); summer, fall and spring (second year). Tyndall.

960 [360] (ORAD) ORAL RADIOLOGY RESEARCH (1–4). Arranged. Faculty on staff.

993 [393] (ORAD) MASTER'S THESIS (3).

Core Courses Required

701 [201] (DENG) RESEARCH METHODS (1). Fall. Wright.

702 [202] (DENG) BIOSTATISTICS (2). Spring. Phillips.

703 [203] (DENG) APPLIED RESEARCH METHODS (2). Fall. Beck.

707 [207] (OMSU) REGIONAL ANATOMY (3). Summer. Kernick.

762 [262] (ORPA) HISTOLOGY AND HISTOPATHOLOGY (2). Fall. Curran.

763 [263] (ORPA) HISTOLOGY AND HISTOPATHOLOGY (2). Spring. Curran.

Orthodontics

Admission for graduate study in orthodontics is made only after the department faculty and The Graduate School review and approve a completed application. Application for entry into the program in August should be made by October 1 of the previous year. Interviews are scheduled in November. Admission decisions normally are made in late November.

The three-year curriculum in orthodontics is designed to prepare dentists for clinical practice in the specialty of orthodontics and meets the educational requirements for later specialty board certification. All students participate in research in the department and are expected to earn the master of science degree by completing a thesis project.

During the program's first year, students participate in seminars selected from the principal didactic courses, discuss clinical topics in seminars and begin patient care. As the program progresses, didactic seminars gradually are replaced by research participation, while clinical seminars continue and the volume of patient care increases. All students must perform satisfactorily on oral and written comprehensive examinations to complete the program successfully.

Graduate Courses in Orthodontics

706 [206] (ORAD) ADVANCED ORAL RADIOLOGY (2). Acquaints graduate students with the radiographic techniques and equipment currently available to the profession. Includes a review of appropriate radiographic anatomy. Spring. Tyndall.

801 [201] (ORTH) ORTHODONTIC TECHNIQUE (4). Introduction to orthodontic technique and procedures for beginning orthodontic graduate students. Fall (first year). Tulloch, faculty on staff.

802ab [302ab] (ORTH) CURRENT TOPICS IN ORTHODONTICS (2, 2). Seminars on pertinent orthodontic literature for advanced orthodontic students. Fall and spring. Proffit.

803ab [203ab] (ORTH) ORTHODONTIC DIAGNOSIS (2, 2). Principles of orthodontic diagnosis and analysis of diagnostic records for orthodontic specialists. Fall and spring. Koroluk, faculty on staff.

805abcd [205abcd] (ORTH) ADVANCED CLINICAL ORTHODONTICS (5, 3, 7, 7). Fall, spring and summer. Proffit, faculty on staff.

806 [206] (ORTH) SCIENCE OF TOOTH MOVEMENT (2). Mechanical principles in orthodontic force production and control; biological response to orthodontic force. Fall. Kusy, Hershey.

807 [207] (ORTH) ORTHODONTIC BIOMATERIALS (1-3). Introduction to orthodontic biomaterials and integration with the basic principles of engineering, science and orthodontics. Spring. Kusy.

808 [208] (ORTH) GROWTH AND DEVELOPMENT (4). Principles of growth and development, emphasizing dento-facial development from an evolutionary and molecular biology perspective, as well as the traditional anatomical perspective. Spring. Frazier-Bowers, faculty on staff.

809 [209abcde] (ORTH) PREVENTATIVE ORTHODONTICS (3).

813 [213] (ORTH) PRINCIPLES OF ORTHODONTIC TREATMENT FOR ADULTS (2). Orthodontic treatment procedures for adults; for AEGD, periodontic and prosthodontic graduate students. Fall. Beane.

815 [215] (ORTH) ORAL-PHARYNGEAL FUNCTION (1). Maturation of oral and pharyngeal function, including speech and its relation to dento-facial development. Fall. Trotman.

820 [220] (ORTH) ADVANCED BIOMECHANICS (2). Concepts in orthodontic mechanics emphasizing segmented arch approaches and laboratory tests of appliance components and designs. Summer. Hershey, Kusy.

822 [222] (ORTH) ENVIRONMENT OF SPECIALTY PRACTICE (3). Trends in health care delivery; organization and management of orthodontic specialty practice. Fall. Beane, faculty on staff.

901abc [301abc] (ORTH) RESEARCH (2, 1, 2). Arranged. Proffit, Phillips.

993 [393] (ORTH) THESIS (3 or more).

Pediatric Dentistry

The Advanced Education Program in Pediatric Dentistry requires participation in both the centralized application and matching services. Application requires submission of the required transcripts and documentation to the Postdoctoral Application Support Service (PASS), 1625 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036. All candidates must register with the Postdoctoral Dental Matching Program, 595 Bay Street, Suite 300, Toronto, Ontario, Canada M5G 2C2. A personal interview is required and interviews are made by invitation of the department after reviewing applicants' records. All candidates must complete an application to The Graduate School once they have been selected for an interview.

The department offers a graduate program in Pediatric Dentistry leading to the M.S., M.P.H., or Ph.D. degree. The minimum program length is 36 months, beginning July 1 of each year. The program's goal is to prepare the student for a career in academic research, dental education clinical practice or public health. Developing leadership skills and training advocates for children's health is emphasized. For interested students, this program can be combined with other educational programs in the social sciences, basic sciences or allied health professions leading to an additional master's degree, postdoctoral fellowship, an individual Dentist-Scientist award or a doctoral degree.

During the first year each student completes courses in research design and statistics. A protocol for the research project is completed in conjunction with the course work during the first year. This project provides a background in the scientific method and scientific writing. During the second year data are collected, and during the third year the thesis is written and defended. Under the direction of leaders in many fields of research, research opportunities are available in a wide range of topics and can be undertaken in the School of Dentistry, in the Dental Research Center, at a facility in nearby Research Triangle Park or at a neighboring institution of higher learning. Numerous projects have received national acclaim and have resulted in publications in dental literature. Hospital training is gained through the University of North Carolina Hospitals. Graduate students are active members of the department's teaching team during all years. Development of leadership skills in the health profession is supported by externships at the local, state and national levels.

Stipends are available depending upon available resources.

Graduate Courses in Pediatric Dentistry

800abcd [200abcd] MATERNAL AND CHILD HEALTH SEMINAR SERIES (1, 1, 1, 1). (One hour a week for each fall and spring semester.) This is a seminar series that focuses on a broad range of topics related to pediatric dentistry and pediatric medicine, including general medical issues, practice management, social issues, child advocacy and presentation of unusual clinical cases. Roberts.

801abcdef [201abcdef] PEDIATRIC DIAGNOSIS AND TREATMENT PLANNING SEMINAR (1, 1, 1, 1, 1, 1). (One hour a week each fall and spring semester for two years.) This course is a seminar wherein diagnosis and treatment planning options are considered through a problem-oriented approach. For cases in progress and completed, outcomes are reviewed and critiqued. Vann.

803abcd [203abcd] PRINCIPLES OF PEDIATRIC DENTISTRY (Six hours a month for fall and spring semesters for 24 months). This seminar covers the fundamentals of pediatric dentistry from behavior management to pulp therapy. The course relies on readings of classic and contemporary literature with seminars that include discussions and critiques of readings. Vann and Pediatric Dentistry faculty.

804abcd [204abcd] ADVANCED CLINICAL PEDIATRIC DENTISTRY (Six to 12 hours a week for 36 months). This course provides clinical experience in all phases of pediatric dentistry, including dental treatment under conscious sedation and general anesthesia. Faculty on staff.

805 [205] CONTEMPORARY PRACTICE MANAGEMENT (One hour monthly during the spring semester for three years). This course provides an understanding of the design, implementation and management of a modern pediatric dental practice. Most seminar leaders are private practitioners who are adjunct faculty in the department. Vann.

806abcd [206abcd] TREATMENT OF PEDIATRIC DENTAL EMERGENCIES (One hour a week each week for 36 months). This seminar series serves as a faculty/resident forum for reviewing the previous week's emergency cases and in which diagnosis and treatment options are reviewed and critiqued. Endodontic faculty and residents also participate in this course. Vann.

901-904 [301] RESEARCH (Minimum of one half-day a week for 36 months). Students pursue an institutionally approved research project under the guidance of the faculty following review of the pertinent literature and planning on the basis of sound experimental design. Faculty on staff.

993 [393] MASTER'S THESIS. Faculty on staff.

Periodontology

The graduate program in periodontology is designed to prepare dentists to enter the clinical practice of periodontics or to assume positions in academics and research. Stipends are provided during the three years of study.

The program consists of a 36-month course of study leading to a certificate in periodontics and a master of science degree. Alternative degree programs include a master of public health or a Ph.D. in oral biology. The first two years are devoted primarily to the study of biological concepts and literature that relate to periodontology, as well as to the acquisition of clinical skills in diagnosing and treating diseases affecting tooth supporting tissues. A portion of the first two years is devoted to research. The third year involves a combination of patient care, teaching, research and the successful completion of a thesis. Elective courses relating to areas of research interests are available.

The admission policy for graduate training in periodontology follows the regular requirements for admission to The Graduate School. Admission to The Graduate School is granted only after the department reviews and approves the application, transcripts of prior academic work, letters of reference and other credentials. All applications, transcripts and letters of reference should be mailed to the Postdoctoral Application Support Service (PASS), 1625 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036. All application materials should be submitted by August 15 for the following summer class beginning July 1. A personal interview is required for admission.

Students begin the program July 1. The number of students is limited to three each year.

Graduate Courses in Periodontology

710, 711 [266abc] (PERI) PERIODONTAL THERAPY (1, 1). This graduate seminar reviews techniques and procedures for treating periodontal diseases. Topics include gingival grafting, surgical flap management, osseous surgery, periodontal regeneration, antimicrobials, host modulation and periodontal medicine. Summer and fall. Rahman.

720, 721, 722, 723 [268abde] (PERI) CASE ANALYSIS (10). Course participants present comprehensive cases with periodontal conditions. Discussion focuses on periodontal diagnosis, treatment planning, treatment execution and results. Fall and spring. Paquette.

730, 731 [270ab] (PERI) SEMINAR IN PERIODONTOLOGY (6). In this first-year literature review course, graduate students present and evaluate the evidence on periodontal disease etiology, pathogenesis, risk factors and treatments including mechanical, surgical and pharmacological approaches. Fall and spring. Paquette.

760, 761 [271ab] (PERI) SEMINAR IN PERIODONTOLOGY (6). In this second- and third-year literature review course, graduate students discuss evidence on advanced topics in periodontology or related disciplines. Fall and spring. Williams.

820 [320] (PERI) INTRODUCTION TO IMPLANTS (1). This graduate seminar traces the biology of osseointegration, surgical techniques in dental implant placement and prosthetic restoration. The seminar includes didactic lectures, case presentations and journal club components. Fall. Moriarty.

821 [321] (PERI) CLINICAL IMPLANTOLOGY (1). This graduate seminar continues themes introduced in PERI 820 and discusses advanced implant topics including bone augmentation, peri-implantitis and implant efficacy assessment. The seminar includes didactic lectures, case presentations and journal club components. Spring. Moriarty.

890, 891 [250ab] (PERI) ADVANCED CLINICAL PERIODONTICS AND CLINICAL PRACTICE (9). Within this first-year specialty clinic, graduate students begin diagnosing and comprehensively treating patients with periodontal diseases. Cases may involve interdisciplinary care, medical management, dental implants and sedation procedures. Fall, spring and summer. Department faculty.

892, 893 [251ab] (PERI) ADVANCED CLINICAL PERIODONTICS AND CLINICAL PRACTICE (9). Within this second- and third-year specialty clinic, graduate students gain proficiency in managing patients with periodontal diseases, using both surgical and non-surgical approaches. Cases may involve interdisciplinary care, medical management, dental implants and sedation procedures. Fall, spring and summer. Department faculty.

990, 991 [301bc] (PERI) RESEARCH (5 each). Fall, spring and summer. Department faculty.

993 [393] (PERI) THESIS (3 or more).

Prosthodontics

The admission policy for graduate training in prosthodontics follows the regular requirements for admission to The Graduate School. Admission to The Graduate School is granted only after the application, transcript of prior academic work, letters of reference, and other credentials are reviewed and approved by the appropriate committee. All applications, transcripts and letters of reference should be mailed to the Postdoctoral Application Support Service (PASS), 1625 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036. All application materials should be submitted by September 15 for the following summer class beginning July 1. A personal interview is required for admission.

The Graduate Program in Prosthodontics is currently a 36-month course of study in fixed and removable prosthodontics, dental implant prosthodontics and maxillofacial prosthetics leading to a master of science degree. The primary goals of the program are to prepare a student for clinical practice and/or a teaching and research career. The curriculum offers a broad educational experience in clinical, research, didactic and teaching activities. The program satisfies the formal training requirements of the American Board of Prosthodontics for certification examination in prosthodontics.

Stipends are available at various levels throughout the entire course.

Graduate Courses in Prosthodontics

701, 702, 703 [230abc] (PROS) INTRODUCTION TO PROSTHODONTIC LITERATURE (2, 2, 2). A seminar designed to review early and classic prosthodontic literature common to fixed and removable prosthodontics. Summer (first year); fall and spring (third year). Director, faculty on staff.

704, 705, 706 [230def] (PROS) INTRODUCTION TO PROSTHODONTIC LITERATURE.

721-726 [231abcdef] (PROS) PROSTHODONTIC PRINCIPLES, DIAGNOSIS AND TREATMENT PLANNING—FIXED AND REMOVABLE (2, 2, 2, 2, 2, 2). Principles of diagnosis and treatment relative to the prosthodontic patient are covered in depth in this seminar series. Fall and spring (first year); summer, fall and spring (second year); summer (third year). Director, faculty on staff.

731-736 [237abcdef] (PROS) PROSTHODONTIC DIAGNOSIS AND TREATMENT PLANNING (1, 1, 1, 1, 1, 1).

736a, 736b [236ab] (OPER) GRADUATE DENTAL MATERIALS (3). This is a foundation course for dental materials science and dental materials applications. Fall and spring. Bayne.

751-754 [233abcde] (PROS) MAXILLOFACIAL PROSTHODONTIC PRINCIPLES, DIAGNOSIS AND TREATMENT (1, 1, 1, 1, 1). Principles of diagnosis and treatment relative to maxillofacial prosthodontic patients are covered in depth in this seminar series. Summer, fall and spring (second year); summer (third year). Minsley, faculty on staff.

801-808 [232abcdef] (PROS) ADVANCED CLINICAL FIXED AND REMOVABLE PROSTHODONTICS (1, 3, 3, 5, 5, 5). This clinical offering is designed to permit the graduate student to experience all phases of advanced patient management in fixed and removable prosthodontics. Summer, fall and spring (first year); summer, fall and spring (second year); summer, fall and spring (third year). Director, faculty on staff.

851-854 [234abcd] (PROS) CLINICAL MAXILLOFACIAL PROSTHODONTICS (2, 2, 2, 2). This clinical offering is designed to permit the graduate student to manage the comprehensive prosthodontic care of congenital and/or acquired maxillofacial defects in both the dental school and hospital environment. Spring (first year); summer, fall and spring (second year); summer, fall and spring (third year). Minsley, faculty on staff.

901-906 [235abcdef] (PROS) RESEARCH (2, 3, 3, 3, 5, 5). The graduate pursues the literature and selects a research project planned and conducted under the direction of the appropriate graduate faculty. Spring (first year); summer, fall and spring (second year); summer, fall and spring (third year). Graduate faculty.

993 [393] (PROS) MASTER'S THESIS (3 or more). Completion of thesis for master of science degree. Spring (third year). Graduate faculty. top

In addition to the courses listed, core courses are required in anatomy, microbiology, pharmacology, oral pathology, research methodology, scientific writing and dental education. Flexibility in the curriculum also allows opportunity for appropriate electives.

Graduate Elective Courses

A number of graduate courses from allied clinical and biomedical disciplines are available as electives for prosthodontic graduate students. Though not required, elective courses are encouraged. Interest in electives (from within or outside the School of Dentistry) should be discussed with the program director so that the core curriculum can be adjusted to accommodate the student's needs.

Endodontics

The Department of Endodontics offers a three-year program leading to a certificate in endodontics and a master of science degree. The program is designed to prepare candidates for careers in academics, research, or the clinical practice of endodontics, and for certification by the American Board of Endodontics.

The endodontics graduate program involves an integrated study of biological sciences as they pertain to Endodontics, development of the clinical skills required in the broad area of the endodontic specialty, review of classic and current literature in Endodontics, teaching experience, research design and methodology, and the development and completion of a research project.

Enrollment is limited to two candidates each year. The course of study begins July 1 of each year.

Graduate Courses in Endodontics

710, 720, 730, 740, 750 [210abcde] (ENDO) ADVANCED CLINICAL ENDODONTICS (29). 870 hours of clinical practice. Faculty on staff.

811, 821, 831, 841 [211abcde] (ENDO) ENDODONTICS SEMINAR AND CASE ANALYSIS (15). 180 hours conference. Faculty on staff.

812, 822, 832, 842 [212abcde] (ENDO) ENDODONTICS LITERATURE REVIEW SEMINAR (20). 270 hours. Faculty on staff.

920, 921, 922, 923 [220abcde] (ENDO) RESEARCH (15). 675 hours of laboratory. Faculty on staff. Required each semester.

993 [393] THESIS (3 or more). Third year.

Core Courses Required of Graduate Students in Endodontics

701 [201] (DENG) RESEARCH DESIGN (1). Refer to the core and multi-use listing.

702 [202] (DENG) BIOSTATISTICS (2). Refer to the core and multi-use listing.

703 [203] (DENG) APPLIED RESEARCH METHODOLOGY (2). Refer to the core and multi-use listing.

706 [206] (ORAD) ADVANCED ORAL RADIOLOGY (2). Refer to the core and multi-use listing.

707 [207] (OMSU) REGIONAL ANATOMY (3). Refer to the core and multi-use listing.

720 [220] (OMSU) CLINICAL PHARMACOLOGY AND THERAPEUTICS (1). Refer to the core and multi-use listing.

720 (233) (OBIO) TOPICS IN ORAL BIOLOGY.

Dental Hygiene Education

The primary objective of the dental hygiene education master of science program is to prepare well-qualified educators for dental hygiene programs. At the successful completion of this program, the student should be able to 1) give evidence of having acquired advanced knowledge and skills in one of the following minors: dental management/administration, dental radiology, science basic to dental hygiene education, oral pathology and clinical education, 2) develop the knowledge, skills and attitudes necessary in the conduct of dental hygiene programs, 3) teach courses in more than one dental hygiene field and 4) define their own problems from the present body of knowledge in dental and dental hygiene education, solve the problems and present their work in a scholarly fashion.

Credit hour requirements vary and are based on the individual background of the student and on the minor selected by the student. Thirty-nine credit hours are required in the core (including thesis or research) and nine to 12 hours in the minor. The length of the program is approximately two years. Minimum admissions requirements for the program include current licensure and a bachelor's degree from an accredited institution, and graduation from a dental hygiene program accredited by the Commission on Dental Accreditation, American Dental Association. Work experience in dental hygiene education or dental hygiene practice is strongly recommended.

Applicants must have a grade point average of B or better in the professional undergraduate curriculum. Three letters of recommendation are required, as well as completion of an admissions questionnaire by the applicant. The course of study begins July 1 of each year. An application to the University can be obtained by writing to the Admissions Office, School of Dentistry, CB# 7450, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-7450. For further information, contact Coordinator, Dental Hygiene Education Program, School of Dentistry, CB# 7450, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-7450, (919) 966-2800.

Core Courses Required of Graduate Students in Dental Hygiene Education

701 [201] (DENG) RESEARCH DESIGN (1). Refer to the core and multi-use listing. Fall. Wright.

702 [202] (DENG) BIOSTATISTICS (2). Refer to the core and multi-use listing. Spring. Phillips.

703 [203] (DENG) APPLIED RESEARCH METHODOLOGY (2). Refer to the core and multi-use listing. Fall. Beck.

715 [115] (DHED) CURRENT CONCEPTS IN CLINICAL SKILLS (2). This course reviews and updates students in current treatment and diagnostic modalities in dental allied education. Students who satisfactorily pass the evaluation will be exempt. Summer. Wilder.

720 [120] (DHED) EDUCATIONAL CONCEPTS (2). This course is designed to introduce the graduate student to various teaching philosophies and methodologies. A variety of educational concepts such as methods of presentation, testing and measurement are explored. Emphasis is placed on the practical application of theory. Summer. Wilder.top

730 [230] (DHED) ORGANIZATION AND ADMINISTRATION (3). Provides information and experience in leadership, administration and accreditation for allied dental education programs. Spring. George.

736 [136] (DHED) CLINICAL/LABORATORY TEACHING PRACTICUM (2). This course provides students with the knowledge and skills to function as a competent clinical instructor. Psychomotor skill development and analysis and remediation of performance problems are two topics related to clinical teaching that are stressed. Fall. Peterson.

760ab [160a] (DHED) SEMINAR IN EDUCATION AND RESEARCH (1). This course is designed to provide knowledge and stimulate discussion about pertinent topics in dental and allied dental education and research. Fall. Wilder.

837 [237] (DHED) INTERNSHIP (6–9). This full semester internship provides the student with the opportunity to student teach in an allied dental program. Spring. George.

860 [160b] (DHED) SEMINAR IN EDUCATION AND RESEARCH (1). Fall. Wilder.

993 [393] (DHED) THESIS (3). Fall and spring. Wilder.

ELECTIVE (3).

Additional courses are required for each minor as follows:

Biological Sciences

102 (DENT) GROSS ANATOMY (4). Levitch.

104 (DENT) MICROSCOPIC ANATOMY (4). Hadler.

114 (DENT) PHYSIOLOGY (4). Moss.

Clinical Education

753 [153] (DHED) ADVANCED INTRAORAL FUNCTIONS (3). Wilder.

754 [154] (DHED) ADVANCED INTRAORAL FUNCTIONS (PERIODONTICS) (3). Wilder.

833 [233] (DHED) SEMINAR AND PRACTICUM IN DENTAL RADIOLOGY EDUCATION (4). Overman.

836 [236] (DHED) ADVANCED/CLINICAL TEACHING (3). George.

Dental Radiology

190 (ORAD) COMPREHENSIVE RADIATION BIOLOGY (Var.).

662 (RADI) INSTRUMT AND /IMAGING METHODS (4)top.

Management/Administration

774 [474e] (DHED) PERSONNEL MANAGEMENT SEMINAR (2). Wilder.

834 [234] (DHED) DENTAL MANAGEMENT SEMINAR (4). Wilder.

ELECTIVE (3).

Oral Pathology

104 (DENT) MICROSCOPIC ANATOMY (4). Hadler.

127 (DENT) PATHOLOGY I (3). Bentley.

202 (DENT) PATHOLOGY II (2). Murrah.

Department of Dramatic Art

www.unc.edu/depts/drama
McKAY COBLE, *Chair*

Professors
McKay Coble, Chair, Design
Raymond L. Dooley, Head of M.F.A. Acting, Acting
Roberta A. Owen (2) Costume Design and History
Bonnie N. Raphael, Voice and Speech
Craig W. Turner, Head of Graduate Studies, Movement for the Actor
Adam N. Versenyi, Dramaturgy

Associate Professor
Michael J. Rolleri, Head of Technical Production

Adjunct Professors
Judith L. Adamson, Head of Costume Production
James Robert McLeod, Technical Production

Assistant Professors
Janet A. Chambers, Design
Scott D. Ripley, Acting

Lecturer
Kristine Rapp, Costume Production

The Department of Dramatic Art offers professional training programs in acting, costume production and technical production leading to the master of fine arts degree. The production facilities in the Center for Dramatic Art include the Paul Green Theatre and the Elizabeth Price Kenan Theatre along with studios, rehearsal hall, costume complex and scene shops.

Each student is responsible for becoming familiar with the general regulations of The Graduate School and particularly with the dates indicated on the calendar for the academic year. This information is contained elsewhere in the *Graduate Record*. Please note that, due to the nature of the professional training programs, the calendar for graduate students in the Department of Dramatic Art will not always coincide with that of the University. Graduate students in the department are frequently required to work on productions during University scheduled holidays.

A limited number of graduate appointments are available in the department. Appointments are presently awarded in the areas of acting, technical production, costume production and in support of introductory courses (DRAM 115, 116 and 135). All appointments involve instructional or laboratory supervisory responsibility.

Master of Fine Arts

Purpose. Through disciplined classroom training and a progressive involvement in performance or production opportunities, students in the master of fine arts (M.F.A.) programs are challenged to develop the skills and attitudes that enable them to compete in the professional theatre. Emphasizing accomplishment in a wide range of performance and production styles, the programs complement the variety of theatrical experiences available in the PlayMakers Repertory Company (PRC), a professional full-season equity company and a member of The League of Resident Theatres. Within his or her area of specialization, upon graduation students will be ready to perform a variety of roles or assume a range of responsibilities onstage or backstage in stage, film or television. The University of North Carolina at Chapel Hill is a member of URTA (University/Resident Theatre Association, Inc.).

Prerequisites. All applicants must meet admission requirements established by The Graduate School of the University of North Carolina at Chapel Hill. Each area of specialization within the department requires additional application materials. In the costuming and technical areas, applicants are required to submit portfolios. Candidates should check with the department for further information as to what is entailed for each area. All acting candidates must audition. In addition to on-campus auditions, the department holds auditions two out of every three years in February in New York and Chicago. Applications must be received by January 31 to be considered.

Curriculum. Each candidate pursues a course of study in a conservatory environment. Classroom training offers a variety of approaches, each designed to develop and refine the candidate's artistic and professional potential. Classroom work is augmented by participation in the professional season of PlayMakers Repertory Company. In addition to the PRC, students find performance opportunities in studio projects and productions.

Evaluation. At least once each semester, the faculty formally evaluates the candidate's progress and makes recommendations concerning his or her continuation in the program. Evaluations are made of each individual on the basis of classroom and performance or production work. Letter grades (H, P, L, F) are assigned for work in all courses.

Admission. Generally, only first-year applicants are considered for admission. Candidates should check with the department for admission information pertaining to their specific area of specialization (i.e., acting, technical production or costume production).

Residency and Requirements. All candidates are required to be in residence for three years, six consecutive semesters. The departmental system of evaluation requires that the student be invited to continue in the second and then in the final year of the program. While all programs require their students to complete 60 credit hours, those hours are apportioned differently from program to program. In addition to 60 credit hours, each area of specialization carries its own graduation requirements. Candidates are encouraged to ascertain individual requirements for graduation as soon as possible.

Detailed information can be obtained by addressing inquiries to the Director of Graduate Studies, Department of Dramatic Art, CB# 3230, Center for Dramatic Art, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3230. Additional information is available on the Web at www.unc.edu/depts/graduate/home_graduate.htm.

Courses for Graduates and Advanced Undergraduates

280 [175] PERIOD STYLES FOR THE THEATRE (3). A study of visual, cultural, and social styles through history as the forms developed, and as they relate to stylistic production for the theatre. Fall and spring. Coble.

290 [192] SPECIAL STUDIES (.5–3). Prerequisite, permission of the instructor and of the undergraduate advisor. Open only to majors in the Department of Dramatic Art. Credit for performance and/or production experience in Department of Dramatic Art productions, including PlayMakers Repertory Company. A minimum of 15 hours per week is required during the rehearsal period; a faculty evaluation is also required at the close of the production. May be repeated for credit. Fall and spring. Staff.

331 [157] PLAYWRITING II (3). Prerequisite, at least one semester of DRAM 231. A practical course in the writing of the stage play. (Alternate years.).

395 [194] PROFESSIONAL THEATRE LABORATORY (3–12). Prerequisite, permission of the department chair. Individual programs or internships in acting, directing, design, management and playwriting under the guidance of professional practitioners in conjunction with the PlayMakers Repertory Company or of other approved professional theatre organizations. Locally supervised.

Open only to advanced students. (Offered as required.) Staff.

450 [150] SHAKESPEARE IN THE THEATRE (3). Prerequisite, DRAM 120. Generally limited to majors only. A study of the literary, stage history and production problems of representative plays. Dooley.

465 [165] SOUND DESIGN (3). The study of general principles of sound design for the theatre. Theory and application of sound design techniques for the stage, including script analysis, staging concepts, special effects, sound plots and technology. Spring.

466 [166] SCENE DESIGN (3). Prerequisite, permission of the instructor. General principles of visual design as applied to scenery for the theatre. Instruction in standard techniques of planning and rendering scene design. Fall. Coble.

467 [167] COSTUME DESIGN I (3). Prerequisite, permission of the instructor. Studies and practicum in play analysis and costume design for the theatre. Instruction in techniques of planning and rendering costume design. Fall and spring. Owen.

468 [168] LIGHTING DESIGN I (3). Prerequisite, permission of the instructor. General principles of lighting design as applied to the performing arts. Theory and instruction in standard techniques of lighting for the stage. Spring.

470 [170] SURVEY OF COSTUME HISTORY (3). A survey of historic costume forms from ancient Egypt to the present time. Fall. Owen.

473 [173] COSTUME CONSTRUCTION I (1–3). Prerequisite, permission of the instructor. Beginning instruction in pattern making through flat pattern for theatrical costume. Fall. Adamson.

474 [174] COSTUME CONSTRUCTION II (1–3). Prerequisite, DRAM 473 or permission of the instructor. Beginning instruction in pattern making through draping on a dress form for theatrical costume. Spring. Adamson.

475 [171] COSTUME HISTORY: AFRICA, ASIA AND ARABIA (3). A survey of the traditional costume forms on the African continent, in Asia (China, Japan, India) and on the Arabian Peninsula. Spring. Owen.

477 [177] THEATRICAL DESIGN (3). Prerequisite, DRAM 120. General principles of scenic, costume and lighting design for the theatre.

480 [185] PERIOD STYLES FOR PRODUCTION (3). A study of the historical development of Western minor arts and the ramifications of reproducing them for the theatre. Students may not receive credit for both DRAM 280 and 480. Spring. (Alternate years.) Coble.

484 [390] STUDIES IN DRAMATURGY AND CRITICISM (3). This seminar seeks to introduce students to the principles of arts criticism through study of the work of a variety of different critics, by distinguishing between the nature of criticism and reviewing the arts, and through the students' own practice of critical writing.

486 [086] LATIN AMERICAN THEATRE (3). Prerequisite, DRAM 120. This course explores the historical and aesthetic development of Latin American theatre, focusing on particular factors that distinguish this theatre from the Western European tradition.

487 CHICANA/O DRAMA (3). Prerequisite, DRAM 120. This course surveys Chicana/o history and culture from 1965 to the present through the examination of plays by and about Chicana/os. It also interrogates Chicana/o performance practices as political acts.

488 U.S. LATINO/A THEATRE (3). Prerequisite, DRAM 120. Investigation of United States Latino/a theatre texts and performance practices as a discreet genre. U.S. Latino/a theatre will be distinguished from the dominant culture, and diversity of forms and styles discussed.

490 [190] THEATRE MANAGEMENT (3). Practicum in theatre management procedures and business of the theatre involving box office, audience development, research, publicity, operational, and contract procedures in regard to artists, technicians, managers and producers. Students actively engage in management areas of the PlayMakers Repertory Company and productions of the Department of Dramatic Art. Fall and spring. Staff.

491 [191] ISSUES IN ARTS MANAGEMENT (3). Arts management issues taught through analysis of case studies. Course includes management theories, organizational structures and current issues. (Alternate years.) Staff.

495 [101] STAGE MANAGEMENT (3). By permission of the department. A study of the basic principles and practices of modern stage management. Fall and spring. Staff.

566 [176] ADVANCED SCENE DESIGN (3). Prerequisite, DRAM 466 or permission of the instructor. Advanced study of the principles and practice of designing scenery for the theatre. Fall. (Alternate years.) Coble.

567 [169] COSTUME DESIGN II (3). Prerequisites, DRAM 467 and permission of the instructor. Practicum in costume design for the theatre, focusing on the requirements of professional theatre production and alternative costume design solutions. Spring. (Alternate years.) Owen.

595 [198] COSTUME SEMINARS I: DYEING AND PAINTING (1–3). Prerequisites, DRAM 192 and permission of the instructor. Series of topics in costume for use in design and production for the stage. May be repeated for credit for a total of six hours for undergraduates and 12 hours for graduate students. Taught in a four-semester rotation. Fall and spring.

597 COSTUME SEMINARS II: MILLINERY AND HAIR (1–3). Prerequisite, permission of the instructor. Advanced costume production techniques with an emphasis on millinery and hair design.

598 COSTUME SEMINARS III: MASKS AND ARMOR (1–3). Prerequisite, permission of the instructor. Advanced costume production techniques with an emphasis on creating masks and armor.

599 COSTUME SEMINARS IV: DECORATIVE ARTS (1–3). Prerequisite, permission of the instructor. Advanced costume production techniques with an emphasis on decorative arts.

650 [196] COSTUME PRODUCTION I: COUTURE METHODS (0.5–3). Prerequisite, DRAM 192. Advanced construction techniques in theatrical costuming with an emphasis on couture methods. Fall and spring. J. Adamson.

667 [245] ADVANCED COSTUME DESIGN I (1–3). Permission of the instructor. Study of costume design for students concentrating in costume production. Spring. Staff.

Courses for Graduates

720 [220] ACTING I (3). Prerequisite, admission to the M.F.A. Acting program. Intensive professional training for the actor. Must be taken fall and spring. Ripley.

721 [221] ACTING II (3). Prerequisite, admission to the second year of the M.F.A. Acting program. Advanced professional training for the actor. Must be taken fall and spring. Dooley.

722 [222] VOICE I (3). Prerequisite, admission to the M.F.A. Acting program. Development of the individual actor's voice and speech. Must be taken fall and spring. Raphael.

723 [223] VOICE II (3). Prerequisite, admission to the second year of the M.F.A. Acting program. Expansion of the individual's vocal versatility in performance. Must be taken fall and spring. Raphael.

724 [224] MOVEMENT I (3). Prerequisite, admission to the M.F.A. Acting program. Development of the actor's body as an expressive instrument. Must be taken fall and spring. Turner.

725 [225] MOVEMENT II (3). Prerequisite, admission to the second year of the M.F.A. Acting program. Advanced projects in movement. Special sessions in tumbling and stage combat. Must be taken fall and spring. Turner.

726 [226] REHEARSAL AND PERFORMANCE I (1-6). Prerequisite, admission to the M.F.A. Acting program. Rehearsal and performance of special ensemble projects. Must be taken fall and spring. May be repeated for credit. Dooley, Raphael, Turner.

727 [227] REHEARSAL AND PERFORMANCE II (1-6). Prerequisite, admission to the second year of the M.F.A. Acting program. Practical application of techniques in rehearsal and performance in studio and main stage production. Must be taken fall and spring. May be repeated for credit. Dooley, Raphael, Turner.

728 [228] ACTING PRACTICUM I (6-12). Prerequisite, admission into the third year of the M.F.A. Acting program. Intense practicum as a member of the PlayMakers Repertory acting company. Preparation and presentation of assigned projects and work in departmental productions. Work in voice and movement as scheduled. Fall. Dooley, Raphael, Turner.

750 SPECIAL STUDIES: COSTUME PRODUCTION II: ADVANCED COUTURE METHODS (.5-3). Advanced construction techniques with an emphasis on advanced couture methods.

752 SPECIAL STUDIES: COSTUME PRODUCTION III: TAILORING (.5-3). Prerequisite, Costume graduate. Advanced construction techniques with an emphasis on bodice development.

760 [242] COSTUME CONSTRUCTION III: ADVANCED FLAT PATTERN (1-3). Prerequisite, DRAM 473. Continued study of pattern making with flat pattern in advanced shapes for the stage. Fall. Adamson.

762 [243] COSTUME CONSTRUCTION IV: ADVANCED DRAPING (1-3). Prerequisite, DRAM 474. Continued study of draping theatrical costumes with advanced shapes. Spring. Adamson.

764 [244] COSTUME CONSTRUCTION V (1-3). Prerequisites, DRAM 473, 474, 760, 762. Using combination of pattern making and dress making techniques to achieve unusual shapes in theatrical costume. Fall or spring. Adamson.

766 [248] COSTUME CONSTRUCTION VI: COMPUTER PATTERN (1-3). Prerequisite, DRAM 473. Continuation of the study of flat pattern using computer software with AutoCad. Spring. Adamson.

770 [172] PERIOD PATTERN I; PRE-VICTORIAN (Var., 1-3). Prerequisite, permission of the instructor. Advanced study of historical pattern, costume crafts, or costume shop management through directed study. Fall and spring. May be repeated for credit. Adamson.

772 PERIOD PATTERN II: VICTORIAN (1-3). Prerequisite, Costume graduate. Study of historical pattern with an emphasis in Victorian era.

774 PERIOD PATTERN III: TWENTIETH CENTURY (1-3). Prerequisite, Costume graduate. Study of historical pattern with an emphasis in twentieth century.

776 PERIOD PATTERN IV: NINETEENTH AND TWENTIETH CENTURY MEN'S WEAR (1-3). Prerequisite, Costume graduate. Study of sartorial arts with an emphasis in nineteenth to twentieth centuries.

780 COSTUME MANAGEMENT I: SUPPLIES AND SUPPLIERS (1-3). Prerequisite, Costume graduate. Study of supplies and suppliers needed to produce theatrical costumes.

782 COSTUME MANAGEMENT II: BUDGET METHODS (1-3). Prerequisite, Costume graduate. Study of cost analysis for costume production.

784 COSTUME MANAGEMENT III: PERSONAL (1-3). Prerequisite, Costume graduate. Study of organization and personnel management for costume production.

790 [240] COSTUME LABORATORY I (3). Prerequisite, admission to the M.F.A. Costume program. Practical work in the costume shop. Must be taken fall and spring. Adamson.

791 [241] COSTUME LABORATORY II (3). Prerequisite, admission to the second year of the M.F.A. Costume program. Advanced practical work in the costume shop. Must be taken fall and spring. Adamson.

792 COSTUME LABORATORY III (3). Prerequisite, Costume graduate. Continuation of practical work through production assignments.

793 COSTUME LABORATORY IV (3). Prerequisite, Costume graduate. Continuation of practical work through production assignments.

796 [247] COSTUME LABORATORY V (1-3). Prerequisite, admission to the third year of the M.F.A. Costume program. Advanced practical work in the costume shop. Must be taken fall and spring. Adamson.

797 COSTUME LABORATORY VI (1-3). Prerequisite, Costume graduate. Continuation of practical work through production assignments.

799 [249] COSTUME PROGRAM INTERNSHIP (3-6). Intensive practicum in Costume Arts, with tutorial and class assignments on an individual basis as required. Fall or spring. May be repeated for credit. Adamson.

800 [100] TECHNICAL DIRECTION (3-6). Prerequisites, permission of the instructor, DRAM 491, Technical Methods, Technical Production section, or equivalent technical practice in theatre production. Study of the technical and engineering problems in production and standard theatrical drafting and construction conventions. Must be taken fall and spring. McLeod, Rolleri, Staff.

801 TECHNICAL DIRECTION II (3-6). Prerequisite, Technical graduate. Additional study of technical and engineering problems in production.

802 [250] ADVANCED TECHNICAL DIRECTION (3-6). Prerequisite, admission to the second year of the M.F.A. Technical Production program. An advanced study of the management, technical, and engineering problems involved in theatrical production. Must be taken fall and spring. Rolleri.

803 [261] ADVANCED TECHNICAL DIRECTION II (1-6). Prerequisite, admission to the third year of the M.F.A. Technical Production program. An advanced study of the management, technical, and engineering problems involved in theatrical production. Must be taken fall and spring. Rolleri.

805 [193] SPECIAL STUDIES: TECHNICAL PRODUCTION (.5-12). Prerequisite, permission of the instructor and DRAM 64, Technical Methods, Technical Production section. Advanced scenic construction techniques leading to specific project or production responsibility in the area of scenic construction in Department of Dramatic Art productions and PlayMakers Repertory Company. A minimum of fifteen hours per week is required during the rehearsal period. Faculty evaluation at the close of the production. May be repeated for credit. Fall and spring. Rolleri.

806 [260] TECHNICAL PLANNING AND PRODUCTION (3-6). Prerequisite, admission into the third year of the M.F.A. Technical Production program. Intensive practicum in production projects for departmental and PlayMakers Repertory Company productions. Must be taken fall and spring. Rolleri.

813 SPECIAL STUDIES: TECHNICAL PRODUCTION (1-6). Prerequisite, Technical graduate. Continuation of advanced scenic construction techniques with specific project or production responsibility in the area of scenic construction.

814 PROFESSIONAL THEATER LABORATORY: TECHNICAL PRODUCTION (.5-12). Prerequisite, Technical graduate. Individual programs in scenic construction techniques.

821 [262] ADVANCED LIGHTING DESIGN (3). Prerequisite, permission of the instructor. This course acquaints the student with professional practice in lighting design through lecture by faculty and visiting professionals and through evaluation of lighting designs executed by students and critiqued by professionals. Spring.

830 [200] SEMINAR IN PROFESSIONAL PRACTICE: TECHNICAL PRODUCTION (1-12). Prerequisite, admission to the M.F.A. program in Technical Production. An examination of professional theatre practice through contact with students, staff, faculty and visiting artists in technical theatre. Generally taken fall and spring. May be repeated for credit. McLeod, Rolleri.

841 [251] DESIGN TECHNICAL THEATRE PRACTICUM I (3-6). Prerequisite, admission into the M.F.A. Technical program. Practical work in scene shop. Must be taken fall and spring. Rolleri.

842 M.F.A./TECHNICAL THEATRE PRACTICUM II (1-6). Prerequisite, Technical graduate. Continuation of practical work in scene shop.

843 [252] DESIGN TECHNICAL THEATRE PRACTICUM II (3-6). Prerequisites, DRAM 841 and admission to the second year of the M.F.A. Tech program. Advanced practical work in scene shop. Must be taken fall and spring. Rolleri.

844 M.F.A./TECHNICAL PRACTICUM IV (3-6). Continuation of advanced practical work in scene shop.

845 [259] DESIGN TECHNICAL INTERNSHIP (6-12). Intensive practicum in production projects for departmental and PlayMakers Repertory Company productions, with independent studies as assigned on an individual basis. May be repeated for credit. Staff.

875 [231] SEMINAR IN DRAMATIC LITERATURE (1-3). Prerequisite, admission to the M.F.A. program in any area. An examination of the literature of the theatre in terms of dramatic construction, theory, and interpretation. May be repeated for credit.

992 [392] GRADUATE FINAL PRACTICUM: THESIS (1-6). J. Adamson, Dooley, Rolleri.

Curriculum in Ecology

www.unc.edu/depts/ecology
ROBERT K. PEET, *Chair*

Professors

Richard N. Andrews (32) Environmental and Energy Policy, Policy Instruments and Incentives
Lawrence E. Band (6) Watershed Hydrology, Ecosystem Water, Carbon and Nutrient Cycling
Larry K. Benninger (37) Low-Temperature Geochemistry
Philip R. Berke (23) Energy; Urban Form and Environmetal Impacts, Land-Use Policy
Joe Carter, Invertebrate Paleontology
J. Robert Cox Jr. (1) Environmental Communication and the Public Sphere; the Role of Discourse in Social Change
Carole I. Crumley (22) Historical Ecology, Paleoclimatology, Landscape Ecology, Archeology
Barbara Entwisle (48) Social Demography, Population and Environment
Patricia Gensel, Paleobotany
Joel G. Kingsolver (11) Environmental Physiology, Functional Morphology, Population Ecology and Evolution
Paul W. Leslie (40) Human Ecology, Population Biology
Melinda S. Meade (36) Cultural Ecology of Population and Health, Third World Development
Hans Paerl, Microbial Ecology, Estuarine and Coastal Ecology, Water Quality Dynamics
Robert K. Peet (26) Plant Community and Population Ecology, Biogeography, Ecoinformatics
Charles H. Peterson (29) Marine Ecology, Population and Community Processes
Frederic K. Pfaender (27) Microbial Ecology, Nutrient Exchanges in Rivers and Estuaries, Estuarine Pollution
David W. Pfennig (44) Evolutionary Ecology
Peter J. Robinson (17) Climatology, Climate Change and Impacts
Stephen J. Walsh (2) Land-use and Land Cover Dynamics; Spatial Modeling and Analysis
Peter S. White (15) Plant Population and Community Ecology, Conservation Biology
R. Haven Wiley (21) Behavioral Ecology of Vertebrates, Avian Social Behavior

Associate Professors

John F. Bruno (10) Ecology and Conservation of Marine Communities
Martin W. Doyle (45) Fluvial Geomorphology, Hydrology, Stream Ecology, Environmental Policy
John W. Florin (33) Population Geography, Medical Geography
Charles E. Konrad (54) Synoptic Climatology and Climate Change
Aaron Moody (12) Remote Sensing, Landscape Ecology, Biogeography, Geographical Information Systems
Seth R. Reice (16) Community Ecology, Disturbance Ecology, Stream Ecology, Sustainable Development
Maria Servedio, Evolutionary Ecology, Behavioral Ecology
Conghe Song (47) Remote Sensing of Vegetation; Ecological Modeling; Geographic Information Systems
Andreas P. Teske (53) Microbial Ecology, Evolution and Systematics
Stephen C. Whalen (7) Nutrient Cycling, Greenhouse Gas Production and Dynamics
Thomas M. Whitmore (42) Historical Agro-Ecology of Middle America

Assistant Professors

Charles Mitchell (56), Disease Ecology, Global Change, Biological Invasions
Karin S. Pfennig (50) Behavioral Ecology and Evolution, Speciation, Host-Parasite Interactions
Michael Piehler, Coastal Ecosystem Ecology and Nutrient Dynamics
Donna Surge (41) Paleoclimatology, Paleoecology, Low-Temperature Geochemistry

Adjunct Professors

Richard E. Bilsborrow (4) Economic Demography, Population, Development and the Environment
Douglas J. Crawford-Brown (43) Environmental Risk Assessment, Mathematical Modeling of Human Health, Philosophical Analysis of Evidence in Decisions, Strategies for Carbon Dioxide Reduction

Adjunct Assistant Professors

Cecil Frost, Fire Ecology, Plant Ecology, Landscape Ecology
Sam Pearsall, Conservation Planning, Adaptive Management, Riparian Landscapes
Johnny Randall, Conservation Biology, Restoration Ecology
James Umbanhowar, Theoretical Ecology, Dynamics of Species Interactions Webs, Host-Parasutoid Interactions
Jack Weiss (49) Biostatistics and Quantitative Ecology
Alan Weakley (51) Plant Systematics, Floristics, Biogeography, Conservation Biology, Bioinformatics

The Curriculum in Ecology is a multidisciplinary, degree-granting program that seeks to foster an understanding and appreciation of ecological systems and to demonstrate the value of ecological approaches to the solution of current and future environmental problems. With the participation of faculty and students from many disciplines and departments, emphasis is placed on interdisciplinary activities that explicitly consider the complexity of the environment and integrated approaches to problem identification and solution. In particular, it seeks to foster an understanding and appreciation of ecological systems, human and nonhuman, and to demonstrate the value of ecological approaches to the solution of current and future environmental problems in North Carolina, the United States and the world.

The Curriculum in Ecology places an emphasis on interdisciplinary activities, and derives one of its major strengths from the participation of faculty and students from many disciplines and departments. Current faculty come from the departments of Anthropology, Biology, Biostatistics, City and Regional Planning, Communication Studies, Environmental Sciences and Engineering, Geography, Geological Sciences, Marine Sciences, Public Policy and Sociology. Whereas degree programs with a strong ecology component may be arranged in other departments, the curriculum—by combining many approaches and methods and by linking the social and natural sciences—explicitly considers the complexity of the environment and the need for integrated approaches

to problem identification and solution.

Using the resources of many departments, the Curriculum in Ecology provides both broad and specialized training in ecology, human ecology and the study of environmental systems. Degrees available in the Ecology Curriculum are the master of science, the master of arts and the doctor of philosophy. Applications will be accepted from persons with varied backgrounds and goals with the specific program of study and research tailored to the needs of the individual.

Requirements for Admission

For admission to the Curriculum in Ecology, an undergraduate degree is required in a natural science such as physics, chemistry, biology, bacteriology, botany, zoology or geology; a social science such as anthropology, sociology or economics; a mathematical area such as statistics, mathematics or systems analysis; an engineering area; or environmental science. The deadline for a completed application in order for students to be considered for fall admission is March 1. However, students must submit all curriculum and Graduate School admission materials by January 1 if they wish to be considered for campus fellowships and other forms of graduate appointments. Late applications will cause students to miss out on some opportunities. Detailed information is available on the Curriculum in Ecology Web site at www.unc.edu/depts/ecology.

Degree Requirements

Every student must gain an understanding of the breadth and depth of the field of ecology as it is treated among various traditional disciplines. This is accomplished in two ways: first, through the ECOL 567 and 569 sequence; and second, through the composition of the student's advisory committee.

Doctor of Philosophy

Each Ph.D. student, in addition to taking ECOL 567 and ECOL 569, must register for ECOL 994 at least once for three hours credit. There are no other course requirements for the Ph.D. except for those designated by the student's graduate advisory committee.

Owing to the diversity of research methods and approaches within the field of ecology, the curriculum has no explicit research skill course requirements for graduate degrees. The student's graduate advisory committee is responsible for seeing that the student has gained the proficiencies expected of a degree candidate in the student's selected area of expertise.

Master's Degrees

Two master's degrees are offered by the curriculum: the master of science degree requiring independent research and a thesis, and the master of arts degree requiring a written library report. All master's degrees are terminal degrees at UNC-Chapel Hill. Master's students must request readmission for Ph.D. work following completion of all requirements for the master's degree.

Master of Science: The master of science course requirements are determined by the student's advisory committee. They must include a minimum of 30 hours of graduate credit (of which no less than 24 hours must be earned in courses, and at least three hours in research), and completion of the thesis. One semester of registration is required in ECOL 567 and ECOL 569, and M.S. students must register for three hours in ECOL 993.

Master of Arts: Requirements for the master of arts are the same as those for the master of science, except a master of arts paper is prepared (ECOL 992) in place of a master's thesis (ECOL 993).

Courses in the Ecology Curriculum

461 [112] FUNDAMENTALS OF ECOLOGY (BIOL 461, ENST 461) (4). Prerequisite, BIOL 201. Students will develop a comprehensive understanding of the field of ecology, including modern and emerging trends in ecology. They will develop literacy in the fundamental theories and models that capture ecological processes; emphasis will also be placed on the relevance of ecology and ecological research for human society.

563 [145] STATISTICAL ANALYSIS IN ECOLOGY AND EVOLUTION (BIOL 563, ENST 563) (4). Prerequisites, BIOL 201 and STAT 151 or 155. A modern introduction to the statistical analysis of data in ecology and evolutionary biology. Emphasis is on computer-intensive methods and model-based approaches. Familiarity with the standard parametric approaches to statistical analysis is assumed. Weiss.

567 [190] ECOLOGICAL ANALYSES AND APPLICATIONS (ENST 567) (3). This course provides an overview of natural and social science approaches to addressing biodiversity conservation and resource management. Concepts and methods from population biology, evolutionary ecology, community ecology and conservation biology will be complemented with approaches from common property theory, indigenous resource management and human evolutionary ecology. Fall. Holt.

569 [199] CURRENT ISSUES IN ECOLOGY (ENST 569) (3). Prerequisites, previous course work in ecology and permission of the instructor required. Topics vary but focus on interdisciplinary problems facing humans and/or the environment. Repeatable. Holt.

669 [255] SEMINAR IN ECOLOGY (BIOL 669) (2). Prerequisite, BIOL 201 or permission of the instructor. Repeatable. Peet, Reice, White, Bruno.

765 [202] FIELD EXPERIENCE IN ECOLOGY (2). Prerequisite, graduate standing in ecology. Organized field work in remote environments with a faculty instructor as approved by student's supervisory committee. Repeatable. Staff.

891 [250] SPECIAL TOPICS IN ECOLOGY (2–4). Prerequisite, permission of the instructor. Repeatable. Staff.

961 [300] RESEARCH IN ECOLOGY (2 or more). Staff.

992 [392] MASTER'S NON-THESIS (3–5). Staff.

993 [393] MASTER'S THESIS (3–6). Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Staff.

Ecological courses in other departments that are considered appropriate for graduate students in the Curriculum in Ecology:

Anthropology

317 [117] EVOLUTIONARY PERSPECTIVES ON HUMAN ADAPTATION AND BEHAVIOR (3). Holt.

703 [203] EVOLUTION AND ECOLOGY (3). Fall. Staff.

704 [204] EVOLUTION AND ECOLOGY (3). Spring. Staff.

755 [255] SEMINAR IN CULTURAL ECOLOGY AND POPULATION (3). Leslie.

766 [266] SEMINAR IN ETHNOBOTANY (3). Scarry.

Biology

350 [126] OCEANOGRAPHY (MASC 401, ENVR 417, GEOL 403) (3). Marine Sciences staff.

453 [150] ANIMAL SOCIETIES AND COMMUNICATION (3). Spring. (Alternate years.) Wiley.

459 [195] FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1–21). Summer. Staff.

462 [146] MARINE ECOLOGY (MASC 440) (3). Spring. Bruno.

463 [147] FIELD ECOLOGY (4). Spring. (Alternate years.) Reice.

469 [151] BEHAVIORAL ECOLOGY (3). Fall. (Alternate years.) K. Pfennig.

471 [132] EVOLUTIONARY MECHANISMS (4). Fall. Kingsolver, D. Pfennig.

476 [114] AVIAN BIOLOGY (3). Spring. Wiley, Feduccia.

476L [114L] AVIAN BIOLOGY LAB (1). Spring. (Alternate years or on demand.) Wiley.

514 [133] EVOLUTION AND DEVELOPMENT (3). Fall. D. Pfennig, Goldstein.

561 [143] ECOLOGICAL PLANT GEOGRAPHY (3). Fall. (Alternate years.) Peet.

563 [145] STATISTICAL ANALYSIS IN ECOLOGY AND EVOLUTION (4). Fall or spring. Weiss.

565 [184] CONSERVATION BIOLOGY (3). (On occasion.) White.

657 [140] BIOLOGICAL OCEANOGRAPHY (ENVR 520, MASC 504) (4). Summer. IMS staff.

661 [142] PLANT ECOLOGY (4). Fall. (Alternate years.) Peet.

662 [247] FIELD PLANT GEOGRAPHY (2). Spring. (Alternate years.) Peet.

666 [186] COMMUNITY AND SYSTEMS ECOLOGY (3). Spring. (Alternate years.) Reice.

666L [186L] LAB IN COMMUNITY AND SYSTEMS ECOLOGY (BIOL 666) (1).

669 [255] SEMINAR IN ECOLOGY (BIOL 255) (2). Peet, Reice, White, Bruno.

857 [259] SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (2). Fall or spring. Lohmann, Wiley.

859 [265] SEMINAR IN MARINE BIOLOGY (2). Fall or spring. Kier, Podolsky.

Biostatistics

664 [164] SAMPLE SURVEY METHODOLOGY (4). Spring. Kalsbeek.

670 [170] DEMOGRAPHIC TECHNIQUES I (3). Fall. Suchindran, Bilsborrow.

City and Regional Planning

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, ENVR 585, PLCY 585) (3). Fall. Andrews.

641 [141] ECOLOGY AND LAND USE PLANNING (3). Fall. Berke.

685 [219] WATER POLICY IN LESSER DEVELOPED COUNTRIES (3). Whittington.

710 [210] MICROECONOMICS FOR PLANNING AND POLICY(1–3). Whittington.

740 [240] LAND USE AND ENVIRONMENTAL POLICY (3). Fall. Berke.

744 [244] DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT (3). Fall. Staff.

745 [245] DEVELOPMENT IMPACT ASSESSMENT (3). Spring. Berke, Burby.

781 [234] WATER RESOURCES PLANNING AND POLICY ANALYSIS (ENVR 781) (3). Fall. Moreau.

784 [233] ENVIRONMENTAL LAW (ENVR 784) (3). Fall. Heath.

785 [232] PUBLIC INVESTMENT THEORY (ENVR 785, PLCY 785) (3). Whittington.

786 [236] ENVIRONMENTAL QUALITY PLANNING (ENVR 785) (3). Spring. Moreau.

Communication Studies

675 [175] ENVIRONMENTAL COMMUNICATION AND THE PUBLIC SPHERE (ENST 675) (3). Spring. Cox.

Economics

454 [165] ECONOMICS OF POPULATION (3). Fall or spring. Turchi.

855 [265] ECONOMICS AND POPULATION (3). Spring. Turchi.

Environmental Sciences and Engineering

403 [110] ENVIRONMENTAL CHEMICAL PROCESSES (ENST 403) (3). Fall. Staff.

412 [112] ECOLOGICAL MICROBIOLOGY (3). Spring. Pfaender.

413 [113] LIMNOLOGY (3). Fall. Whalen.

415 [115] BIOGEOCHEMICAL PROCESSES (ENST 450, GEOL 450, MASC 450) (4). Fall. (Alternate years.) Arnosti.

417 [117] OCEANOGRAPHY (BIOL 350, MASC 401, GEOL 403) (3). Spring. Staff.

419 [119] CHEMICAL EQUILIBRIA IN NATURAL WATERS (3). Fall. Singer.

430 [130] HEALTH EFFECTS OF ENVIRONMENTAL AGENTS (3). Fall. Ball.

461 [160] ENVIRONMENTAL SYSTEMS MODELING (GEOL 415, ENST 415, MASC 415) (3). Spring. Staff, Rial, Werner.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, PLCY 585, PLAN 585) (3). Fall. Andrews.

701 [216] ECOLOGY OF AQUATIC PLANTS AND WETLAND ECOSYSTEMS (3). Spring. (Even years.)

765 [275] MODEL-BASED EXPOSURE MAPPING AND RISK ASSESSMENT (3). Spring. Christakos.

767 [279] MODELING FOR ENVIRONMENTAL RISK ANALYSIS (POLI 767, PLCY 767) (3). Fall. Staff.

781 [291] WATER RESOURCES PLANNING AND POLICY ANALYSIS (PLAN 781) (3). Fall. Moreau.

784 [290] ENVIRONMENTAL LAW (PLAN 784) (3). Fall. Heath.

786 [292] ENVIRONMENTAL QUALITY PLANNING (PLAN 786) (3). Spring. Moreau.

Environmental Science and Studies

403 [110] ENVIRONMENTAL CHEMICAL PROCESSES (ENVR 403) (3). Fall. Staff.

411 [102] OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (GEOL 411, MASC 411) (4). Spring. Shay.

415 [106] ENVIRONMENTAL SYSTEMS MODELING (ENVR 461, GEOL 415, MASC 415) (3). Spring. Staff, Rial, Werner.

470 [198] ENVIRONMENTAL RISK ASSESSMENT (ENVR 470) (3). Spring. Crawford-Brown.

480 [120] ENVIRONMENTAL DECISION MAKING (PLCY 480). (3). Spring. Andrews.

489 [103] ECOLOGICAL PROCESSES IN ENVIRONMENTAL SYSTEMS (4). Spring. Staff.

510 [183] POLICY ANALYSIS OF GLOBAL CLIMATE CHANGE (PLCY 510) (3). Webster.

520 [184] ENVIRONMENT AND DEVELOPMENT (PLCY 520) (INTS 520) (3). Rabindran.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENVR 585, PLAN 585, PLCY 585) (3). Fall. Andrews

675 [175] ENVIRONMENTAL COMMUNICATION AND THE PUBLIC SPHERE (COMM 675). (3). Spring. Cox.

Epidemiology

600 [160] PRINCIPLES OF EPIDEMIOLOGY (3). Fall and spring. Schoenbach, Alexander.

785 [277] ENVIRONMENTAL EPIDEMIOLOGY (3). (On request.) Loomis.

786 [278] COMMUNITY-DRIVEN EPIDEMIOLOGY AND ENVIRONMENTAL JUSTICE (2). (On request.) Wing.

Geography

232 [132] AGRICULTURE, FOOD AND SOCIETY (3). Florin, Whitmore.

237 [137] NATURAL RESOURCES (3). Whitmore.

410 [110] MODELING OF ENVIRONMENTAL SCIENCES (3). Staff.

412 [112] SYNOPTIC METEOROLOGY (3). Konrad, Robinson.

414 [114] PHYSICAL CLIMATOLOGY (3). Konrad, Robinson.

416 [116] APPLIED CLIMATOLOGY (3). Robinson, Konrad.

419 [119] FIELD METHODS IN PHYSICAL GEOGRAPHY (3). Doyle, staff.

420 [120] FUNDAMENTAL CONCEPTS OF HUMAN GEOGRAPHY (3). Florin.

434 [134] THE CULTURAL ECOLOGY OF AGRICULTURE AND DISEASE (3). Meade, Whitmore.

435 [135] ENVIRONMENTAL POLITICS (3). Kirsch.

440 [140] EARTH SURFACE PROCESSES (3). Band.

441 [141] INTRODUCTION TO WATERSHED SYSTEMS (3). Band.

442 [142] RIVER PROCESSES (3). Doyle.

444 [144] LANDSCAPE BIOGEOGRAPHY (3). Moody.

445 [145] MEDICAL GEOGRAPHY (3). Fall. Meade.

450 [150] POPULATION GEOGRAPHY (3). Florin, Meade, Whitmore.

477 [177] INTRODUCTION TO REMOTE SENSING AND DIGITAL IMAGE PROCESSING (3). Fall. Moody, Song, Walsh.

491 [191] INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (3). Fall. Moody, Song, Walsh.

577 [178] ADVANCED REMOTE SENSING (3). Moody, Song, Walsh.

591 [192] APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (3). Spring. Moody, Song, Walsh.

595 [195] ECOLOGICAL MODELING (3). Fall. Song.

705 [205] ADVANCED QUANTITATIVE METHODS IN GEOGRAPHY (3). Moody.

710 [210] ADVANCED PHYSICAL GEOGRAPHY—BIOGEOSCIENCE (3). Staff.

711 [211] ADVANCED PHYSICAL GEOGRAPHY—HYDROCLIMATOLOGY AND BIOCLIMATOLOGY (3). Staff.

715 [215] LAND USE/LAND COVER DYNAMICS AND HUMAN-ENVIRONMENT INTERACTION (3). Walsh.

790 [290] SPATIAL ANALYSIS AND COMPUTER MODELING (3). Staff.

801 [201] RESEARCH SEMINAR IN EARTH SYSTEM SCIENCE AND BIOPHYSICAL GEOGRAPHY (3). Staff.

802 [202] RESEARCH SEMINAR IN GEOGRAPHIC INFORMATION SCIENCES (3). Staff.

803 [303] RESEARCH SEMINAR IN NATURE-SOCIETY STUDIES AND HUMAN-ENVIRONMENT INTERACTIONS (3). Staff.

811 [311] SEMINAR/READINGS IN EARTH SYSTEM SCIENCE AND BIOPHYSICAL GEOGRAPHY (3). Staff.

812 [312] SEMINAR/READINGS IN GEOGRAPHIC INFORMATION SCIENCES (3). Staff.

813 [313] SEMINAR/READINGS IN NATURE-SOCIETY STUDIES AND HUMAN-ENVIRONMENT INTERACTIONS (3). Staff.

Marine Sciences

401 [101] OCEANOGRAPHY (BIOL 350, ENVR 417, GEOL 403) (3). Fall and spring. Staff.

410 [111] EARTH PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 410, GEOL 410) (4). Fall. Benninger, Band.

411 [112] OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 411, GEOL 411) (4). Spring. Shay.

415 [116] ENVIRONMENTAL SYSTEMS MODELING (ENST 415, ENVR 461, GEOL 415) (3). Spring. Rial, Scotti, Werner.

430 [125] COASTAL SEDIMENTARY ENVIRONMENTS (GEOL 430) (3). Spring. (Alternate years.) Staff.

440 [146] MARINE ECOLOGY (BIOL 462) (3). Fall. (Alternate years.) Peterson.

449 [137] ECOLOGY OF WETLANDS (ENVR 414) (4). Fall. Staff.

450 [119] BIOGEOCHEMICAL PROCESSES (ENST 450, ENVR 415, GEOL 450) (4). Fall. (Alternate years.) Arnosti, Martens.

472 [138] BARRIER ISLAND ECOLOGY AND GEOLOGY (6). Summer. Bruno, Peterson, Wells.

504 [104] BIOLOGICAL OCEANOGRAPHY (BIOL 657, ENVR 520) (4). Spring. Lindquist.

505 [105] CHEMICAL OCEANOGRAPHY (ENVR 418, GEOL 505) (4). Fall. Martens, Arnosti, Alperin.

506 [106] PHYSICAL OCEANOGRAPHY (GEOL 506) (4). Fall. Bane, Seim.

741 [248] SEMINAR IN MARINE BIOLOGY (2). Fall. Staff.

Political Science

741 [207] LATIN AMERICAN POLITICS RESEARCH AND ANALYSIS (3). Entwisle.

Public Policy

480 [120] ENVIRONMENTAL DECISION MAKING (ENST 480) (3). Spring. Andrews.

510 [183] POLICY ANALYSIS OF GLOBAL CLIMATE CHANGE (ENST 480) (3). Fall or spring. Webster.

520 [184] ENVIRONMENT AND DEVELOPMENT (ENST 520) (INTS 520) (3). Fall. Rabindran.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, ENVR 185, PLAN 585) (3). Fall. Andrews.

Sociology

453 [153] SOCIAL CHANGE IN LATIN AMERICA (3). Smith.

707 [207] MEASUREMENT AND DATA COLLECTION (3). Entwisle.

803 [218] HUMAN ECOLOGY (3). J. Blau, Nielsen.

830 [212] DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART I (3). Rindfuss, Uhlenberg, Entwisle, Harris.

831 [213] DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART II (3). Rindfuss, Uhlenberg, Entwisle, Mouw.

832 [287] MIGRATION AND POPULATION DISTRIBUTION (3). (On demand.) Uhlenberg.

Department of Economics

www.unc.edu/depts/econ
JOHN S. AKIN, *Chair*

Professors
John S. Akin (1) Health Economics, Public Finance, Human Resources
Gary A. Biglaiser (63) Microeconomic Theory, Industrial Organization
Patrick J. Conway (56) Economic Development, International Economics
Alfred J. Field, Jr. (6) Economic Development, International Economics
Richard T. Froyen (7) Macroeconomics, Monetary Policy
Eric Ghysels (86) Econometrics
David K. Guilkey (39) Econometrics
Eric M. Renault (90) Econometrics
Steven S. Rosefielde (26) Comparative Economic Systems
Michael K. Salemi (38) Macroeconomics, Monetary Economics
John F. Stewart (36) Industrial Organization
Helen V. Tauchen (40) Applied Microeconomics

Associate Professors
Donna B. Gilleskie (81) Health Economics, Econometrics
Lutz A. Hendricks (11) Macroeconomics, Human Capital, Economic Growth, Wealth Inequality
Peter Norman (95) Microeconomics, Public Economics
William R. Parke (65) Econometrics
Sergio O. Parreiras (89) Game Theory, Microeconomics
Boone A. Turchi (31) Demography

Assistant Professors
Sandra Campo-Manton (91) Applied Industrial Organization, Microeconomics
Anusha Chari (16) International Finance, Open-Economy Macroeconomics
Saraswata Chaudhuri (12) Econometrics
Neville R. Francis (92) Macroeconomics, Time Series
Jonathan B. Hill (10) Time Series Econometrics, Econometric Theory
Vijay Krishna (94) Economic Theory, Game Theory
Oksana M. Leukhina (82) Macroeconomics
Brian McManus (14) Empirical Industrial Organization, Applied Microeconomics
Sang Soo Park (15) Cross-Sectional Econometrics

Adjunct Professors
James J. Anton
Richard E. Bilsborrow
Peter A. Coclanis
Jennifer S. Conrad
Barry M. Popkin
Frank A. Sloan
H. Wilbert van der Klaauw
Adjunct Associate Professors
Scott A. Baker
Robert A. Connolly
Sally C. Stearns
Rachel A. Willis

Lecturers
Michael D. Aguilar, Financial Econometrics
Rita A. Balaban, Applied Microeconomics, Economic Education
Ralph T. Byrns, Monetary Theory, Financial Markets, Behavioral Economics
Burton B. Goldstein, University Entrepreneur in Residence
Stephen W. Lich-Tyler, Labor Economics, Public Economics, Applied Microeconomics, Household and Family Economics
John McCallie, Monetary Theory, International Economics
Geetha Vaidyanathan, Macroeconomics, Statistics

Professors Emeriti
Dennis R. Appleyard
Arthur Benavie
Stanley W. Black
William A. Darity Jr.
James W. Friedman
A. Ronald Gallant
James C. Ingram
David McFarland
James L. Murphy
Thomas J. Orsagh
Ralph W. Pfouts
Vincent J. Tarascio
Roger Waud
James A. Wilde
Xiaodong Wu

The graduate program in the Department of Economics prepares students for teaching and research careers in the fields of econometrics, financial econometrics, health economics, international trade and development, labor economics, microeconomic theory/industrial organization, and monetary and open economy macroeconomics. During the first year of the program, students concentrate on the core areas of econometrics, macroeconomics and microeconomics. Later, each student chooses two fields of specialization within those mentioned. The department's objective is to provide students both with broad training in theory and econometrics and with specialization in the major and minor fields.

A number of students supplement their study in economics at UNC-Chapel Hill with work in finance, statistics, mathematics, biostatistics, urban and regional studies, computer science and operations research, along with courses at Duke University and North Carolina State University. Strong offerings in these and other related areas enhance the overall graduate training offered to students.

Master of Science

The focus of the graduate program in economics is on the doctorate offerings. Most of the students in the master's program have already been admitted to a Ph.D. or professional program at UNC-Chapel Hill.

The master's degree requires ECON 710, 720 and 700, one course in econometrics (ECON 771 or 870), two courses in a major field, three electives and a research course (ECON 992 for the M.S. degree). Courses are to be selected in consultation with, and with the approval of, the director of graduate studies and the faculty in the major field. A master of science student writes a research paper under the direction of the faculty advisor. Also, all candidates must pass a written exam in the major field, with the paper advisor responsible for the examination. The

Graduate School Handbook describes the general requirements for the master's examinations and for the papers.

Doctor of Philosophy

Course Requirements. A doctoral candidate must complete fifteen Ph.D.-level courses plus two semesters of the doctoral dissertation course (ECON 994). Unless otherwise specified by the faculty in the major field, at least 12 of the 15 courses must be from the Economics Department. All courses must be approved by the director of graduate studies.

Courses in the Fundamentals of Economics. The following seven courses or their equivalents are required: ECON 710, 711, 720, 721, 700, 770 and one additional econometrics course.

Courses in the Major and Minor Fields within Economics. Each student selects a major and a minor field from among the following fields within economics:

- Econometrics
- Financial Econometrics
- Health Economics
- International Trade and Development
- Labor Economics
- Microeconomic Theory/Industrial Organization
- Monetary and Open Economy Macroeconomics

At least three courses in the major field and two courses in the minor field are required. One of the courses in the major field is usually a seminar course.

Courses in Supporting Fields. The remaining courses are supporting courses chosen by the student in consultation with the director of graduate studies and other faculty. The supporting courses may be within the major or minor field or in areas that complement the major and minor fields.

Foreign Languages-Research Skill. Additionally, a student must demonstrate competence in one foreign language or fulfill a research skill requirement. Courses satisfying the research skills requirement are usually in econometrics, quantitative methods, mathematics, statistics or computer science.

Doctoral Exams and Dissertation. Students must pass qualifying exams in macroeconomics, microeconomics and the major field. The faculty in each field determines whether the major field qualifier is a four-hour written exam or a paper. The qualifiers are given in August and January of each academic year; major field papers are due during the week of written exams. The three-hour macroeconomics and microeconomics qualifying exams are first taken in August of the second year and the major field qualifier in August of the third year. The exams are also given in early January. Students have two chances to pass each of the exams and may petition the Appeals Committee for permission to take the macroeconomics or microeconomics qualifier for the third time.

The *Graduate School Handbook* describes the requirements for the doctoral oral exam, doctoral dissertation and final oral defense of the dissertation. The doctoral oral exam includes an evaluation of the thesis prospectus.

The general regulations of The Graduate School apply to students receiving graduate degrees in economics from the University of North Carolina at Chapel Hill.

Fellowships and Assistantships. The department offers several fellowships and a number of research and teaching assistantships. All applicants to the Ph.D. program are considered for financial support, and most students enrolled in the Ph.D. program receive a stipend, tuition assistance and health insurance from departmental or other University sources. Detailed information regarding the fellowships, assistantships, and instructorships may be obtained from the director of graduate studies in economics, or at www.unc.edu/depts/econ.

Courses for Graduates

Graduate standing in economics or permission of the director of graduate studies in economics is required for all courses numbered 700 or higher.

700 [210] BASIC QUANTITATIVE TECHNIQUES (3). Topics from linear algebra, calculus, linear and nonlinear programming, and the theory of difference and differential equations with applications to economics. Fall. Tauchen.

706 [207] GENERAL ECONOMIC THEORY (3). Prerequisite, graduate standing in a department other than economics. Theory of demand, production, market structures and economic welfare, national income accounts and theory of national income determination, unemployment, inflation. (Not regularly offered.)

710 [200] ADVANCED MICROECONOMIC THEORY I (3). Prerequisites or corequisites, ECON 410 and 700 or equivalent. Consumer and producer theory, expected utility, perfect competition and monopoly, introduction to general equilibrium and welfare economics. Fall. Krishna, Tauchen.

711 [201] ADVANCED MICROECONOMIC THEORY II (3). Prerequisite, ECON 710 or equivalent. General equilibrium and welfare economics, game theory and oligopoly, information economics. Spring. Biglaiser, Norman.

720 [202] ADVANCED MACROECONOMIC THEORY I (3). Prerequisite, ECON 420 or equivalent. Keynesian and classical equilibrium models; the neo-Keynesian synthesis; monetarist and other alternative analytic frameworks. Fall. Francis, Froyen, Leukhina, Salemi.

721 [203] ADVANCED MACROECONOMIC THEORY II (3). Prerequisite, ECON 720 or equivalent. Growth models, general equilibrium approach to monetary theory; input-output; disequilibrium theory; extensions of Keynesian and classical models. Spring. Francis, Leukhina, Salemi.

770 [271] INTRODUCTION TO ECONOMETRIC THEORY (3). Probability theory, expectation, conditional expectation, modes of convergence, limit and interchange theorems, and the asymptotics of maximum likelihood, generalized method of moments and efficient method of moments. Fall. Parke, Renault.

771 [272] ECONOMETRICS (3). Prerequisite, ECON 770 or equivalent. One semester coverage of basic econometrics. Topics include regression under ideal and nonideal conditions, special models including simultaneous equations models, and applications and econometric computer programs. Spring. Guilkey.

799 EXPERIMENTAL (1–3).

806 [311] SEMINAR IN TEACHING METHODS IN ECONOMICS (3). Prerequisite, doctoral candidacy in economics or permission of the instructor. Covers skills in lecturing, encouraging student participation and active learning, writing exams, planning and evaluating courses. Students design and teach a module that includes class discussion and hands-on learning. Fall or spring. Conway, Salemi, Tauchen.

810 [221] GAME THEORY I (3). Prerequisite, ECON 710, 711 or permission of the instructor. Noncooperative games in strategic and extensive form, with perfect and imperfect information. Other topics from information economics, mechanism design, auctions, repeated games, bargaining, bounded rationality, learning, evolutionary games, cooperative games. Fall or spring. Biglaiser, Parreiras, Krishna.

811 [225] GAME THEORY II (3). Prerequisite, ECON 810 or permission of the instructor. This course is a continuation of ECON 810. Topics covered will be chosen from those listed, but not covered in ECON 810. Fall or spring. Biglaiser, Krishna, Parreiras.

820 [281] MONETARY THEORY (3). Examination of theory and evidence on money demand, money supply and portfolio analysis. Barter versus monetary economics, portfolio school, monetarism, monetary theories of interest rate determination. Fall. Francis, Froyen, Hendricks, Salemi.

821 [282] MONETARY POLICY (1-3). Prerequisite, ECON 720 or permission of the instructor. Optimal policy under uncertainty, financial intermediation and monetary control, channels of monetary influence, monetary policy and inflation, rules versus authority. Spring. Francis, Froyen, Hendricks.

830 [235] GENERAL ECONOMIC HISTORY (3). Preindustrial societies, early stages in industrial growth, and growth of the world economy in the 19th century. (Not regularly offered.)

831 [236] MODERN ECONOMIC HISTORY (3). Prerequisite, ECON 830 or permission of the instructor. Economic change in modern Western societies. Comparative study of growth in Europe and North America. (Not regularly offered.)

840 [240] ADVANCED PUBLIC FINANCE: EXPENDITURE (3). Analysis of market failure and reasons for public spending, cost-benefit analysis and program budgeting, public decision making, redistribution and fiscal equity, intergovernmental transfers. (Not regularly offered.)

841 [241] ADVANCED PUBLIC FINANCE: REVENUES (3). Prerequisite, ECON 840 or permission of the instructor. Criteria for judging tax structures, incidence and impact of taxation, user charges and debt finance, intergovernmental coordination and macroeconomic effects. (Not regularly offered.)

845 [245] ADVANCED BUSINESS ORGANIZATION AND SOCIAL CONTROL (3). Prerequisite, permission of the instructor. Extensive readings in the literature are required. Emphasis is placed upon the role of economic analysis in dealing with problems in this field. (Not regularly offered.)

846 [248] ECONOMIC REGULATION OF INDUSTRY (3). Economic regulation in theory and practice. Principles of optimal regulation are developed, and regulatory performance in various industries is appraised. Fall or spring. Biglaiser.

850 [250] HEALTH ECONOMICS (3). Prerequisites, ECON 710 and 771 or permission of the instructor. Measurement and modeling of the demand for medical care, the demand for and supply of health insurance, and the incorporation of health, medical care and health insurance in determining both short and long run labor supply. Fall or spring. Akin, Gilleskie.

851 [255] HEALTH ECONOMICS FOR DEVELOPING COUNTRIES (3). Prerequisites, ECON 710 and 771 or permission. Major topics are: how health and development are related, the demand for health services, cost-benefit and cost-effectiveness analysis, and methods for financing health care in developing, resource-constrained nations. Fall or spring. Akin.

855 [265] ECONOMICS AND POPULATION (3). Prerequisite, graduate standing in economics or permission of the instructor. Analysis of economic-demographic interrelationships including: population and economic development; population, environmental decay, and zero population growth; models of fertility, migration, and spatial organization; population policy. (Not regularly offered.)

860 [261] THEORY OF INTERNATIONAL TRADE (3). Prerequisite, graduate standing in economics or permission of the instructor. The theory of international values, comparative advantage and the gains from trade, commercial policy. Fall or spring. Conway.

861 [262] INTERNATIONAL MONETARY ECONOMICS (3). Prerequisite, graduate standing in economics or permission of the instructor. Analysis of the international monetary system, exchange rates, the process of adjustment in the balance of payments. Fall or spring. Conway, Chari.

865 [263] ECONOMIC DEVELOPMENT: THEORY AND POLICY (3). Prerequisite, permission of the instructor. Intensive study of the development processes and problems of the less developed countries, with emphasis on theories of growth and development, internal and external policies, and planning strategies. Fall or spring. Conway, Field.

866 [264] SELECTED TOPICS IN ECONOMIC DEVELOPMENT AND DEVELOPMENT PLANNING (3). Prerequisite, ECON 865 or equivalent. Examination of various topics in economic progress of the less developed countries, with special emphasis on the role of international issues. Fall or spring. Staff.

867 [267] COMPARATIVE ECONOMIC SYSTEMS (3). This course focuses on alternative theories of United States capitalism, French indicative planning, Yugoslavian worker-managed market socialism, Soviet central planning and the Chinese worker-controlled decentralized planning model. (Not regularly offered.)

868 [253] SOCIALIST ECONOMIC THOUGHT IN HISTORICAL PERSPECTIVE (3). (Not regularly offered.)

870 [273] ADVANCED ECONOMETRICS (3). Prerequisites, ECON 770, ECON 771 and MATH 547. ECON 870 constitutes a one-semester treatment of the fundamental theory of econometrics. Topics covered include asymptotic distribution theory, linear and nonlinear models, specification testing techniques and simultaneous equations models. Fall. Campo-Manton, Chaudhuri, Guilkey, Parke, Renault.

871 [274] TIME SERIES ECONOMETRICS (3). Prerequisite, ECON 870. Covers stationary univariate and multivariate time series models, spectral analysis methods, nonstationary models with time trends, unit roots and cointegration, and special topics such as conditional volatility, the Kalman filter and changes of regime. Spring. Ghysels, Hill, Parke, Renault.

872 [275] NONLINEAR ECONOMETRIC METHODS (3). Prerequisite, ECON 870. Density estimation, nonparametric regression, neural nets, nonlinear regression, generalized method of moments, seminonparametric time series, estimating stochastic differential equations and nonlinear latent variables. (Not regularly offered.)

873 [276] CROSS SECTIONAL ECONOMETRICS (3). Prerequisite, ECON 870. Maximum likelihood methods for limited dependent variables. Longitudinal data models and methods. Hazard models. Multivariate models with limited dependent variables. Fall or spring. Guilkey.

876 [388] ADVANCED TOPICS IN EMPIRICAL FINANCE (3). Corequisites or prerequisites, ECON/BUSI 875 and ECON 871. This course will cover a selected list of current empirical research topics in finance and related econometric methods. Fall or spring. Ghysels.

877 FOUNDATIONS FOR CONTINUOUS TIME ASSET PRICING (3). Prerequisites, STOR 634 and STOR 635. This course introduces students to mathematical foundations and economic interpretation of the main probabilistic tools (stochasatic calculus, martingale methods) in continuous time finance. Fall or spring. Renault.

880 [291] LABOR ECONOMICS I (3). Prerequisite, ECON 710 or permission of the instructor. An analysis of the short- and long-run aspects of supply and demand of labor, including empirical analysis of the labor force behavior of males, females, blacks and whites. Topics include the microeconomic effects of marriage, fertility, and mobility on labor supply, as well as the macroeconomic effects of unemployment on inflation. Fall or spring. Staff.

881 [294] LABOR ECONOMICS II (3). Life cycle analysis of supply and demand for labor as a determinant of individual wages. Topics include an analysis of discrimination, union power, and governmental manpower policies on the distribution of earnings across the population. Fall or spring. Staff.

890 [399] SEMINAR. Prerequisite, permission of the instructor. Individual research in a special field under direction of a member of the department. Fall and spring. Staff.

892 RESEARCH PRACTICUM (1–3). Students complete a pre-approved internship under the direction of a faculty member and the Director of Graduate Studies. A paper summarizing the research work is required. Fall and spring. Staff.

896 INDEPENDENT STUDY (1–3).

899 EXPERIMENTAL (1–3).

911 [300] SEMINAR IN MICROECONOMIC THEORY I (1–3). This

course introduces students to the literature and research methods used in microeconomic theory. May be repeated for credit. Fall or spring. Biglaiser, Krishna, Norman, Parreiras.

920 [381] SEMINAR IN MONETARY ECONOMICS (3). Prerequisite, permission of the instructor. Advanced study of theoretical and applied topics in monetary economics. Fall or spring. Francis, Froyen, Hendricks, Leukhina, Salemi.

921 [301] SEMINAR IN MACROECONOMIC THEORY II (1–3). Graduate students examine current issues and literature with the purpose of initiating research projects in macroeconomics, monetary theory, and international finance. May be repeated for credit. Fall or spring. Francis, Froyen, Hendricks, Leukhina, Salemi.

931 [335] SEMINAR IN ECONOMIC HISTORY (1–3). The course introduces students to current problems and techniques of study and research in economic history. May be repeated for credit. (Not regularly offered.)

951 [355] RESEARCH IN HEALTH ECONOMICS (1–3). The course allows graduate students to become familiar with current issues and research topics in health economics. May be repeated for credit. Fall or spring. Akin, Gilleskie.

956 [341] RESEARCH IN PUBLIC FINANCE (1–3). This course introduces students to the literature and research methods used in applied microeconomics including public finance. May be repeated for credit. Fall or spring. Stewart, Tauchen, Turchi.

958 [365] SEMINAR IN POPULATION (3). Prerequisite, graduate standing in economics. For advanced population students, this course addresses the newest and most advanced economic demography literature. (Not regularly offered.)

960 [361] SEMINAR IN INTERNATIONAL ECONOMICS (3). Prerequisites, ECON 860 and 861 or equivalent. A directed reading and research course. Fall or spring. Conway, Chari..

966 [363] SEMINAR IN ECONOMIC DEVELOPMENT (1–3). This course is an introduction to the literature and research methods of economic development and transition economies. May be repeated for credit. Fall or spring. Conway, Field, Rosefielde.

968 [396] SEMINAR IN SOVIET ECONOMICS (3). Prerequisite, permission of the instructor. Studies of selected problems of the Soviet economy and related aspects of Soviet economic thought. Seminar members are expected to present reports on assigned research topics. (Not regularly offered.)

971 [371] RESEARCH IN ECONOMETRICS (3). The course introduces students to theoretical and applied research topics in econometrics. May be repeated for credit. Fall or spring. Campo-Manton, Chaudhuri, Ghysels, Guilkey, Hill, Park, Parke.

981 [391] SEMINAR IN LABOR (1–3). The course introduces students to research topics in labor economics. May be repeated for credit. Fall or spring. Staff.

985 [375] SEMINAR IN APPLIED MICROECONOMICS (3). Prerequisite, permission of the instructor. This course offers advanced graduate students the opportunity to begin to develop independent research in applied microeconomic fields. Fall or spring. Gilleskie.

990 SPECIAL TOPICS (1–3). Fall and spring. Staff.

992 [392] MASTER'S PAPER (3). Fall and spring. Staff.

993 [393] MASTER'S THESIS (3). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3). Fall and spring. Staff.

School of Education

soe.unc.edu

G. WILLIAMSON MCDIARMID, *Dean*

Professors

Frank Brown (013) Policy Studies, School Law, Organizational Behavior and Theory, Leadership and Administration
Gregory J. Cizek (176) Educational Assessment and Evaluation
Barbara D. Day (019) Early Childhood Education
Fenwick English (998) Educational Administration, Curriculum Inquiry and Leadership
Jill Fitzgerald (024) Literacy Issues (Early Childhood, Families)
Susan Friel (115) Mathematics Education
John P. Galassi Jr. (028) School Counseling
Madeleine R. Grumet (170) Culture, Curriculum, and Change
Audrey L. Heining-Boynton (037) Foreign Language Education, English as a Second Language
Ryuko Kubota (169) Foreign Language Education
Catherine Marshall (105) Politics, Qualitative Inquiry, Gender, Race, and Class Issues
Judith L. Meece (055) Educational Psychology, Measurement and Evaluation, Elementary Education
George W. Noblit (057) Sociology of Education, Qualitative Research Methods, Critical Race Studies
Sam Odom, Early Childhood, Disability
Xue Lan Rong (146) Social Studies Education, Social Foundations of Education, Large Data Set Research
Rune J. Simeonsson (073) Child Development and Disability, Psychological Assessment, Primary Prevention
Lynda Stone (147) Philosophy of Education, Social Theory, Feminism
Linda Tillman (036) Educational Leadership
Gerald Unks (082) Culture, Curriculum, and Change
Lynne Vernon-Feagans, Early Childhood Intervention, Literacy
William B. Ware (085) Educational Psychology, Measurement and Evaluation, Research Design Analysis
Barbara H. Wasik (086) Child Psychology, Emotional and Cognitive Development, Behavior Modification

Associate Professors

Patrick T. Akos, School Counseling
Cheryl Mason Bolick (029) Education Technology and Social Studies Education
Harriet A. Boone (149) Early Intervention, Family Support and Ethics
Kathleen Brown (182) Educational Leadership
Jill Hamm (183) Adolescent Development
Wallace H. Hannum (034) Instructional Design, Theories of Instruction, Computer Applications
Carol E. Malloy (157) Influence of Culture on Mathematical Problem-Solving, Gender and Equity Issues
Rebecca New, Early Childhood Intervention
Rita O'Sullivan (180) Educational Assessment and Evaluation
Dwight L. Rogers (067) Early Childhood/Elementary Education, Moral Dimensions of Teaching, Teachers as Reflective Practitioners
James Trier, English Education - Secondary

Assistant Professors

Kathleen Gallagher, Child Development and Family Studies
Jocelyn Glazier, Diversity and Multiculturalism, Literacy, Equity
Jeffrey Greene, Cognition and Learning
Dana Griffin, Diversity and Multiculturalism, Professional Development of School Counselors
Leigh Hall, Literacy Studies (Early Childhood, Families)
Steve Knotek (2001) School Psychology
David P. Levine (171) History of Education, Social Studies Education—Middle School and Secondary Grades

Melissa Miller, Special Education
Latish Reed, Education of African American Children, Social and Cultural Studies
Eileen Parsons, African American Science Achievement, Racial Equity
Sam Song, School Psychology
Ollie Steinthorsdottir (2003) Math Education—Elementary

Research Professors

Don Bailey, Early Intervention, Family Support, Assessment
Donna Bryant, Special Education
Martha Cox, Early Childhood, Families and Literacy
James Marshall, Philosophy of Education
Peter Ornstein, Early Childhood, Families and Literacy
Steven Reznick, Early Childhood, Families and Literacy
Pamela J. Winton (092) Families, Early Intervention, Pre-service and In-service Training

Research Associate Professors

Virginia Buysse (159) Community-Based Programs for Young Children with Disabilities and Their Families
Dina Castro-Burgos Early Childhood Intervention, Literacy
Mary Ruth Coleman, Learning Disabilities, Gifted Education
Deborah Hatton, Early Childhood, Families and Literacy
Gloria Harbin, Special Education
Ellen Peisner-Feinberg, Early Childhood Intervention, Literacy
Sharon Ritchie, Early Childhood Intervention, Literacy

Research Assistant Professors

Melissa DeRosier, School Psychology
Kirsten Kainz, Early Childhood Intervention, Literacy
Anita Scarborough, School Psychology
Lorraine Taylor, Early Childhood, Families and Literacy

Clinical Professors

Suzanne A. Gulledge (033) Social Studies Education
Lee Marcus, School Psychology
Russell J. Rowlett (068) Mathematics Education
Patricia Shane, Middle School Preparation, Elementary Science

Clinical Associate Professors

Leslie Babinski, School Psychology
Kelly Coker, School Counseling
Steven Hooper, School Psychology
Daniel M. Huff (102) Choral Music Education, Teacher Preparation, Teacher Socialization
Stanley Schainker, Educational Leadership: Systems Functions, School Management, Group Dynamics
Neil Shipman, Educational Leadership—School Inquiry and Reform
Rhonda M. Wilkerson (117) Elementary Education

Clinical Assistant Professors

Elise Barrett, Middle School Language Arts, Literacy Education
Jennifer Coble, Science Education
Ann Crawford Science Education
Kim Dadisman, Intervention Research
Marcia Davis, Elementary Education
Deborah Eaker-Rich, Social Foundations
Mark Enfield, Science Education
Sandra Evarrs, School Psychology, Psychoeducational Assessment
Joseph Green Upward Bound
Cheryl Horton, Science Education
Molly Lloyd, Literacy Education
Deborah Manzo, Educational Leadership
Kelly Maxwell, School Psychology
Tammie D. Moore, School Counseling, Cross-Cultural Counseling
Denise Morton, Middle Grades Education
Edward M. Neal, Curriculum and Instruction
Merida Negrete, Music Education (K–12)
Chris Osmond, Elementary Education
Sharon Palsha, Child Development and Family Studies
Barbara Rhoades, Art Education
Meg Sheehan, School Administration
Jane Smith, Science Education
Rodney Trice, School Administration
Beril Ulku-Steiner, School Counseling
James Veitch, Educational Leadership—Budget, Staff Development, Technology, Instructional Supervision
Anne Wheeler, School Psychology
Lynn Williford (173) Educational Psychology
Susan Wynn, Educational Leadership

Clinical Instructors

Darcy Berger, Special Education
Camille Catlett, Child Development
Kathy Sikes, Student Coalition for Action in Literacy Education (SCALE)
Sandra Swenberg (029) Elementary Education
Lidia Tyberg, School Psychology

Lecturers

Cecil Coburn
Cheryl Goldstein
Suzanne Harbour
Thomas Metzguer
Melissa Raley
Vergie Taylor

Retired Fixed-Term Professor

John C. Brantley (009) Psychoeducational Assessment, Professional Decision Making, School Psychology

Professors Emeriti

Hunter J. Ballew
Richard A. Brice
Linda Brooks
William I. Burke
Richard H. Coop
James W. Cunningham
James J. Gallagher
R. Sterling Hennis Jr.
Samuel M. Holton
Paul B. Hounshell
Richard C. Hunter
Mary Turner Lane
David L. Lillie
Bobbie B. Lubker
William Malloy
William S. Palmer
Richard C. Phillips
Walter Pryzwansky
William C. Self
Roy E. Sommerfield
Dixie Lee Spiegel
Donald J. Stedman
Gary B. Stuck
Alan Tom
Neal H. Tracy
Eugene R. Watson
Kinnard P. White
Ronald Wiegerink
Ralph E. Wileman Jr.

The School of Education, in keeping with the general goals of the University of North Carolina at Chapel Hill, embraces a threefold mission of teaching, research and service. With these purposes in mind, the school's graduate programs are designed to meet the needs of professional educators who seek to further their knowledge, understanding and skills relating to educational processes. These professionals vary in their career orientations. Some are employed in (or wish to become employed in) educational institutions and others in agencies and organizations performing noninstructional educational functions.

The research mission involves continuing inquiry into the development of knowledge of the teaching-learning process, human development, the organization of schools and educational agencies, the historical, social and philosophical bases for educational institutions and the processes of program development and implementation.

The service mission provides public and private institutions and agencies with the benefits of research and consultation, thereby enhancing these institutions and agencies' ability to satisfy their educational objectives.

The teaching mission involves the faculty and graduate students in applying the knowledge base in field settings and translating it into course work.

The School of Education is headed by Interim Dean Jill Fitzgerald. She is assisted by the Assistant Dean Deborah Eaker-Rich.

The School of Education has attempted to present correct information as of the printing date of this Record. However, this information does not establish a contractual relationship and the school reserves the right to alter any statement when review is complete. Therefore, applicants should contact the School of Education to obtain updated information on programs prior to final application procedures.

Degree Programs

Note: Additional information may be found on the School of Education's Web site at soe.unc.edu

The School of Education offers two doctoral degrees: 1) the doctor of philosophy (Ph.D.) in education with three research areas (culture, curriculum and change; early childhood, intervention and literacy studies; and educational psychology, measurement and evaluation) and in school psychology and 2) the doctor of education (Ed.D.) in educational leadership and in curriculum and instruction. The Graduate School administers the Ph.D., while the School of Education administers the Ed.D.

The master's programs include the following degrees: 1) the master of arts in teaching (M.A.T.) with a concentration in secondary education for English, , mathematics, science, and social studies, a, music, 2) the master of arts (M.A.) in education with three research strands (culture, curriculum and change; early childhood, intervention and literacy studies; and educational psychology, measurement and evaluation) and in school psychology, 3) the master of education (M.Ed.) in school counseling and school psychology, and the master's for experienced teachers, and 4) the master of school administration (M.S.A.) in educational leadership. The Graduate School administers all but the master of school administration program and the master's for experienced teachers, which the School of Education administers.

Two off-campus, part-time programs are offered: the master of education (M.Ed.) for experienced teachers and the flexible master of school administration (M.S.A. Flex). The potential specialty areas for the M.Ed. program are early childhood intervention and family support (birth through kindergarten); elementary education: language arts and social studies, and mathematics and science; middle grades education: language arts, mathematics, science and social studies; secondary education: English, mathematics, science and social studies; K–12 and 9–12: foreign language education; and K–12: literacy education (reading and writing).

The part-time, off-campus M.S.A. Flex program is designed for working professionals and stretches the normal two-year program offered on campus over an extended period of two and a half academic years, beginning each January with a new cohort. While the program emphasizes preparation for the school principalship, individuals with other educational career aspirations (such as district-level leadership positions) will find it appropriate.

Education Degree Requirements

The School of Education offers through The Graduate School the following degrees: M.A., M.Ed., M.A.T., and Ph.D. The School of Education administers the following degrees: M.Ed. for experienced teachers, M.S.A. and Ed.D.

M.A. Degree Requirements

1. A bachelor's degree from a four-year college or university.
2. Completion of the minimum required number of semester hours of advanced course work. (Check with individual programs to ascertain the minimum requirements.)
3. Completion of at least two full semesters of residence.
4. Completion of all required and elective courses within five years of admission.
5. A grade of Pass on a written comprehensive examination.
6. Satisfactory completion of a thesis.
7. The degree application to be filed no later than the date specified in the academic calendar.

M.Ed. Degree Requirements

1. A bachelor's degree from a four-year college or university.
2. Completion of the minimum required number of semester hours of advanced course work. (Check with individual programs to ascertain the minimum requirements.)
3. Completion of at least two full semesters of residence.
4. Completion of all required and elective courses within five years of admission.
5. A grade of Pass on a written comprehensive examination or equivalent.
6. The degree application to be filed no later than the date specified in the academic calendar.

M.A.T. Degree Requirements

1. A bachelor's degree from a four-year college or university.
2. The equivalent of an undergraduate major in the chosen subject area.
3. Completion of a minimum of 40-plus semester hours of advanced course work.
4. Completion of at least two full semesters of residence.
5. Completion of all required and elective courses within five years of admission.
6. Satisfactory completion of a comprehensive teaching portfolio that synthesizes course work and experiences as related to state and national standards.
7. The degree application to be filed no later than the date specified in the academic calendar

Ed.D. (Doctor of Education) Degree Requirements

1. A bachelor's degree from a four-year college or university and a master's degree in the field of education.
2. Completing six hours of graduate work for two consecutive semesters in residence at this university.
3. Students have nine years to complete all work, including the successful defense and submission of the dissertation. Students have six years to complete all course work and oral and written exams.
4. Completion of a research core (12 semester hours) which is comprised of EDUC 684, EDUC 981, EDUC 841 and a Research Methods elective.
5. Completion of a research seminar and a supervised field experience in the student's area of specialization.
6. A grade of Pass on a written comprehensive examination.
7. A grade of Pass on an oral examination.
8. Successful completion of a final oral examination, which is the defense of the dissertation.
9. Satisfactory completion of a dissertation.
10. The degree application to be filed no later than the date specified in the academic calendar.

Ph.D. Degree Requirements

In addition to the requirements of The Graduate School for the Ph.D., the School of Education also requires:

- full-time enrollment until all formal course work is completed; and
- completion of an individual program of studies comprised of required and elective courses.

Programs of Study

Master of Arts (M.A.) in Education

The M.A. in education is designed for individuals from a variety of backgrounds who are interested in research in the field of education. The program should be of particular interest for individuals considering doctoral work in education but who have not yet completed a master's. The M.A. in education is not designed for students interested in receiving licensure.

Students select one of the following areas of specialized study: culture, curriculum and change; early childhood, intervention and literacy studies; or educational psychology, measurement and evaluation. Each student develops an individualized program of study of at least 30 hours with the guidance of an advisor. Working with a three-member committee, the student completes a comprehensive examination and a thesis.

Master of Education (M.Ed.) for Experienced Teachers

The M.Ed. for experienced teachers is a part-time, field-based program for teachers currently employed in local schools, public and private. The program is designed to assist licensed teachers with at least three years of experience in reflecting upon their experiences and developing further skill and art as professional educators. It is a 31-hour program that begins in the summer, extends through the next two years, and concludes in the third summer. Courses are offered at local sites, not on the University campus, for the convenience of practicing teachers. Courses during the school year are offered generally from 4–7 p.m. Courses include the use of the Blackboard software suite of programs, as some portion of students' work is done online via computer.

The M.Ed. in Early Childhood Intervention and Family Support prepares the experienced early childhood professional with leadership skills in developing and implementing inclusive programs for infants/toddlers, preschoolers and kindergartners with and without developmental delays. It is a 34- to 36-hour program that is typically completed by part-time students in two to two and one-half years; and by full-time students in one and one-half calendar years. The program is designed to accommodate practicing professionals' schedules by offering courses in the late afternoon, evenings and during the summer months.

The School of Education offers and administers the M.Ed. for experienced teachers program. For program information or an application, please visit the school's Web site at soe.unc.edu or call 966-1346.

Master of Education (M.Ed.) in School Counseling

The master's program in school counseling is a full-time, 14-month, 60-semester-credit-hour program that begins and ends with summer study. The program prepares students for successful practice in the elementary, middle and senior high schools and is accredited by the Council for Accreditation of Counseling and Related Educational Programs. Upon completing the program, students are eligible for North Carolina Advanced Graduate licensure as school counselors.

The school counseling program is predicated on a developmental advocacy framework that asserts that the counselor's primary mission is to promote the optimal development of all students. The counselor is a school leader who works with students, teachers, administrators, parents and other members of the community to build a supportive learning environment that not only nurtures the development of academic, career and personal/social competence among students, but also fosters an appreciation of diversity and a commitment to social justice. While remediation of deficits and the removal of barriers play a role in this model, developmental advocates focus on proactive and preventive approaches to help students build skills and to enhance the asset-building capacity of the school environment. Traditionally, school counselors have relied upon four primary interventions—individual and small group counseling, consultation, classroom guidance and coordination—to support student development. In recent years, two additional interventions—advocacy and collaboration—have played an increasingly important role in the school counselor's efforts to ensure social justice and to increase the likelihood of optimal development for all students. These last two interventions are especially important for those students who are disenfranchised due to socioeconomic, cultural or lifestyle issues.

Requirements

Students in the M.Ed. school counseling program typically complete the course work in 14 months, beginning and ending with summer study.

1. 51 hours of counseling courses.
2. One, three-hour course in life span human development (EDUC 681).
3. Six hours of graduate-level electives, approved by the advisor.

Semester One—Summer

First Summer Session

EDUC 605 Introduction to School Counseling (three hours)
EDUC 606 Theories of Counseling (three hours)

Second Summer Session

EDUC 608 Pre-Practicum in Counseling (three hours)
EDUC 610 Group Counseling

Semester Two—Fall

EDUC 609 Tests and Measurements (three hours)
EDUC 611+ Practicum in School Counseling (nine hours)

EDUC 681 Human Development (three hours)
EDUC 708 School Consultation Methods (three hours)

Semester Three—Spring
EDUC 607 Promoting Career Development (three hours)
EDUC 705+ Internship in Counseling and Consultation (nine hours)
EDUC 707 Cross-Cultural Counseling (three hours)
EDUC 709 Seminar in Applied Investigations (three hours)

Semester Four—Summer
First Summer Session
EDUC 705+ Internship in Counseling and Consultation (three hours)
EDUC 706 Organizing Guidance Services (three hours)
Second Summer Session
Elective (three hours)
Elective (three hours)
+ Students must spend a minimum of 700 clock hours in their field experiences during the August to June school year. The schedule for completing these hours should be arranged with both the field supervisor and the EDUC 611 and 705 instructors.

The list below provides some examples of appropriate elective courses. It is not exhaustive. All elective courses must be graduate-level (i.e., courses numbered 600 level or above at this university) and must be approved by the student's advisor.

From Education
EDUC 678 Seminar in Educational Studies: Spanish for Educators
EDUC 695 Introduction to Exceptional Children
EDUC 753 Introduction to Curriculum
EDUC 771 Social Foundations of Education
EDUC 782 Psychology of Learning in the School
EDUC 811 Problems in School Counseling

From Psychology
PSYC 461 Cognitive Development
PSYC 462 Development of Language
PSYC 463 Development of Social Behavior and Personality
PSYC 465 Poverty and Development
PSYC 468 Family and Development
PSYC 500 Psychological Disorders of Childhood and Adolescence
PSYC 501 Advanced Personality

From Social Work
SOWO 700 Substance Abuse and Dependency
SOWO 801 Child and Adolescent Health and Mental Health
SOWO 802 Family Stress: Coping and Social Support
SOWO 852 Social Work Practice with Couples
SOWO 853 Approaches to Brief Treatment
SOWO 862 Services for Persons in Grief

From Communication Studies
COMM 312 Persuasion
COMM 620 Interpersonal Communication

Master of Education (M.Ed.) and Master of Arts (M.A.) in School Psychology

The master's program in school psychology is a three-year plus summers, full-time program consisting of two years of course work and a one-year internship. The program covers content and skills in the professional areas of assessment, intervention, research and evaluation, consultation and professional development. Students may elect to receive an M.A. or M.Ed. The M.A. requires a thesis. The program prepares individuals to work in schools and related educational agencies. Graduates are eligible for psychological and educational licensing in North Carolina. The school psychology program is accredited by the National Council for Accreditation of Teacher Education and the National Association of School Psychologists.

Requirements and Prerequisites
Applicants should enter the program with course work in personality theory, abnormal psychology, statistics, learning theories, history systems and developmental psychology. Missing prerequisites are added to the program of study.

Assessment (nine hours)
EDUC 718 Psychoeducational Assessment I (three hours)
EDUC 718 Psychoeducational Assessment II (three hours)
EDUC 718 Psychoeducational Assessment III (three hours)

Intervention (nine hours)
EDUC 719 Behavioral Intervention I (three hours)
EDUC 719 Behavioral Intervention II (three hours)
EDUC 719 Behavioral Intervention III (three hours)

Consultation (three hours)
EDUC 708 School Consultation Methods I (three hours)

Research and Evaluation (17 hours)
EDUC 684 Statistical Analysis of Educational Data I (three hours)
EDUC 709 Applied Investigations (three hours)
EDUC 784 Statistical Analysis of Educational Data II (three hours)
EDUC 992 Project, Semester I (for M.Ed. students) (four hours)
EDUC 992 Project, Semester II (for M.Ed. students) (four hours)
EDUC 993 Thesis, Semester I (**for M.A. students) (four hours)
EDUC 993 Thesis, Semester II (**for M.A. students) (four hours)
** Only 6 hours of thesis credit can be used as part of the 60 hours for graduation.

Professional Development (21 hours)
EDUC 720 Seminar in Professional School Psychology (three hours)
EDUC 721 Externship in School Psychology, Semester I (three hours)
EDUC 721 Externship in School Psychology, Semester II (three hours)
EDUC 721 Externship in School Psychology, Semester III (three hours)
EDUC 721 Externship in School Psychology, Semester IV (three hours)
EDUC 722 Master's Internship in School Psychology, Semester I (three hours)
EDUC 722 Master's Internship in School Psychology, Semester II (three hours)

Psychological Foundations (12 hours)
Biological Bases of Behavior (three hours)
EDUC 763 Neuropsychology (three hours)
Social and Cultural Aspects of Behavior (three hours)
EDUC 707 Cross-Cultural Counseling (three hours)
Human Learning (three hours)
EDUC 782 Psychology of Learning in the School (three hours)
EDUC 882 Seminar in Human Learning and Cognition (three hours)
PSCY 430 Human Memory (three hours)
PSYC 461 Cognitive Development (three hours)
Child and Adolescent Development (three hours)

EDUC 681 Human Development (three hours)
EDUC 762 Child Development and Disability (three hours)
EDUC 781 Theories and Research in Human Development (three hours)
EDUC 881 Seminar in Human Development and Individual Differences (three hours)
PSYC 467 The Development of Black Children (three hours)
SOWO 500 Human Development In Context I: Infancy To Adolescence (three hours)
Human Differences, Human Exceptionality and Developmental Psychopathology
(covered by EDUC 718 and 719 sequences)
Educational Foundations (three hours)
EDUC 628 Methods of Teaching English as a Second Language (three hours)
EDUC 621 Explorations in Literacy (three hours)
EDUC 652 Principles of Instructional Design (three hours)
EDUC 753 Introduction to Curriculum (three hours)
EDUX 622 Content Area Reading and Writing (three hours)

Master of Arts in Teaching (M.A.T.)

The master of arts in teaching (M.A.T.) program is designed for individuals wishing to teach in secondary school (grades 9–12) or in kindergarten–grade 12 special subjects. Secondary school subjects include English, Latin, mathematics, science, and social studies. Special subjects include English as a second language, French, German, Japanese, music and Spanish. This school-based, student-centered program relies on partnerships between public schools and the University and uses the realities of the classroom as the motivation for students to connect theory and practice. It provides opportunities for students to accomplish three general objectives:

1. Expand their understanding of methodology in their content specialization
2. Gain an understanding of curriculum and instruction primarily at the secondary level (but in K-12 in foreign languages, ESL, and music) and
3. Provide knowledge of the social and psychological foundations of education

This program is designed to prepare candidates for initial and advanced teaching licensure in North Carolina.

Several interrelated strands of knowledge run throughout the program:

The Teaching and Methods Strand focuses upon the structure of disciplines, tools of inquiry and methodologies concerned with instructional strategies, planning and assessment in varied learning experiences and communities.

The Learner and Learning Strand helps teachers design and implement learning experiences for students based on subject matter knowledge, the nature of the learning process and the nature of learners.

The Context Strand focuses on teacher-student-community relationships in schools and classrooms. Students will prepare case studies of each type of relationship; analyze them from cultural, historical and pedagogical perspectives; and develop strategies to address these issues in practice.

The M.A.T. is a 12-month, full-time program that requires 40-plus semester hours of course work (40 if a science is taken).

Summer I (Second Session of UNC-Chapel Hill Summer School)

EDUC 641 Introduction to Teaching (three hours)
EDUC 642 Introduction to Schools (three hours)

Fall Semester

EDUC 644 or EDUC 681
EDUC 644 Learner and Learning I (three hours)
EDUC 645 Contexts of Education I (three hours)
EDUC 646 Practica Student Internship (three hours)
EDUC 647 Methods and Materials for Teaching Secondary or K–12 Subjects I (three hours)—with a separate section for each licensure area
EDUC 681 Human Development (for K–12 music)
Advanced course in the content area (three hours)

Spring Semester

EDUC 744Learner and Learning II (two hours)
EDUC 743 Teaching Secondary Students with Disabilities (one hour)
EDUC 746 Practica Student Internship (nine hours)
EDUC 747 Methods and materials for Teaching Secondary or K–12 Subjects II (two hours)

Note: A portfolio of work collected throughout the year will be submitted to the faculty for evaluation at the end of the spring semester.

Summer II (First Session of UNC-Chapel Hill Summer School)

EDUC 748 Advanced Pedagogy (three hours)
EDUC 749 Curriculum Leadership (three hours)
Total Hours: 40+ (for English, Mathematics and Social Studies)

The science program may have 40 hours, if a 4-hour course is taken.

Music, will have extra hours for the required K–12 license. For further information on these programs, contact the M.A.T. program coordinator, or area advisors.

Some clinical placements will include multiple settings and levels of instruction.

Seminars, methods, contexts, learner and learning courses are ongoing over the entire 12-month period and are both interdisciplinary and subject area oriented.

Master of School Administration (M.S.A.)

The M.S.A. on-campus and M.S.A. FLEX programs prepare individuals to lead schools and other educational organizations for the schools of North Carolina and the nation. These programs include three dimensions: 1) Awareness (i.e., acquiring concepts, information, definitions and procedures), 2) Understanding (i.e., interpreting knowledge to school environments, integrating concepts with practice and using knowledge and skills in context) and 3) Capability (i.e., applying knowledge and skills to specific problems of practice). While most of those who complete this program move into administrative positions at the school-site level, some assume roles within state, regional or national organizations that focus on educational professional development, research or policymaking. The completion of this program leads to eligibility for licensure from the North Carolina State Department of Public Instruction and qualifies one for administrative certification in most states. The M.S.A. programs are administered by the School of Education. Visit the Web site at soe.unc.edu.

Doctor of Education (Ed.D.) in Curriculum and Instruction

The Ed.D. program in curriculum and instruction is designed specifically for individuals seeking to be qualified and licensed as curriculum and instructional specialists and other positions in educational, governmental and policy institutions.

The curriculum-instruction specialist is defined as one whose primary concern is improving learning opportunities through providing instructional leadership. The specialist is a decision maker, consultant and advisor to administrators, teachers and other professional personnel. Responsibilities include curriculum development, instruction and staff development.

Applicants are admitted on the basis of their potential for outstanding contributions to education. They should hold a master's degree in a field of education.

The Ed.D. program is administered by the School of Education. Visit the Web site at soe.unc.edu.

Doctor of Education (Ed.D.) in Educational Leadership

The School of Education offers and administers an Ed.D. in educational leadership program which develops senior administrative leaders for the schools of North Carolina and the nation. The program is designed to accommodate the needs of in-residence and employed students. For program information or an application, visit the School of Education's Web site at soe.unc.edu.

Doctor of Philosophy (Ph.D.) in Education

The schools in North Carolina and in the nation face myriad complex issues and challenges. These challenges range from meeting the educational and social-emotional needs of diverse student populations to designing, implementing and evaluating educational programs within cultural contexts. The Ph.D. in education prepares leaders in educational research who understand these issues and who can improve educational practice using state-of-the-art knowledge and research skills. The design of the program fosters collaboration among faculty and students from diverse disciplines. Such cooperation across levels and areas of interest provides the opportunity to develop relevant research agendas. Graduates of this program are prepared for leadership positions in research and teaching at major universities and institutes in the state and nation.

The Ph.D. in education is a single program with three research emphases: culture, curriculum and change; early childhood, intervention and literacy studies; and educational psychology, measurement and evaluation. These three fields blend areas of inquiry that were formerly discrete.

The culture, curriculum and change (CCC) area focuses on the study of educational change and reform through perspectives derived from curriculum studies, educational policy and social foundations. The CCC specialty accommodates a range of individual interests including traditional curriculum disciplines, teacher education, gender studies and cultural studies. The CCC specialty is committed to promoting educational equity.

The early childhood, intervention and literacy studies (ECFL) area focuses on the study of curricular and intervention strategies that promote the development and learning of both typically developing children and children with special needs. Individual student programs of study concentrate on early childhood education, early intervention, early literacy and the roles of cultural context and family in early development.

The educational psychology, measurement and evaluation area focuses on the study of individuals interacting within educational contexts. Individual student programs may emphasize human learning and cognition, human development, instructional design, motivation, individual differences and exceptionality, program evaluation and quantitative methods.

During their first semester of study, all Ph.D. in education students enroll in a school-wide proseminar, a school-wide research methods seminar, a specialty proseminar and a one-hour supervised research experience. In the second semester, all Ph.D. in education students enroll in a "Foundations of Research" course. The program requires a total of 12 credit hours of research methods—two courses required and two courses determined by each student in consultation with her/his committee. Also, a minimum of six credit hours must be taken outside of the School of Education. During the second, third and fourth semesters of study, students enroll with individual faculty for one credit hour of supervised research and writing. The student and advisory committee determine the remaining courses in the 48-credit hour program.

Students in the Ph.D. program are required to maintain full-time enrollment through the completion of course work, with the expectation that they will graduate in three to four years. A master's degree is required before enrolling in the Ph.D. program.

Year One

Fall	***Spring***
Proseminar in Education	Foundations of Research
Fundamentals of Educational Research	Supervised Research
Specialty Seminar	Elective
Supervised Research	Elective

Year Two

Fall	***Spring***
Supervised Research	Supervised Research
Elective	Elective
Elective	Elective
Elective	Elective

Year Three

Fall	***Spring***
Elective	Doctoral Exams
Elective	Proposal Defense
Elective	

Year Four

Fall	***Spring***
Doctoral Dissertation	Doctoral Dissertation

Note: EDUC 684 (Introductory Statistics) or its equivalent must be completed prior to admission to the program or taken during the first year of study. A minimum of six hours of dissertation credit is required.

Doctor of Philosophy (Ph.D.) in School Psychology

The doctoral program in school psychology, fully accredited by the American Psychological Association and approved by the National Association of School Psychologists, prepares school psychologists as scientist-practitioners to assume leadership positions in academic, research and applied settings.

Program graduates are eligible for psychological and educational licensing in North Carolina and national certification by the National Association of School Psychologists.

The doctoral program of studies is comprised of seven areas: prerequisite courses, assessment, intervention, consultation, research and evaluation, externship/internship and foundations. Students are required to take courses from each of the psychological foundations.

I. Prerequisite Courses
Doctoral students in school psychology should enter the program with course work in personality theory, abnormal psychology, history and systems psychology, learning theories and developmental psychology. Missing prerequisites are added to the program of study.

II. Assessment (nine hours)
EDUC 718 Psychoeducational Assessment I (three hours)
EDUC 718 Psychoeducational Assessment II (three hours)
EDUC 718 Psychoeducational Assessment III (three hours)

III. Intervention (nine hours)
EDUC 719 Behavioral Intervention I (three hours)
EDUC 719 Behavioral Intervention II (three hours)
EDUC 719 Behavioral Intervention III (three hours)

IV. Consultation (three hours)
EDUC 708 School Consultation Methods I (three hours)

V. Research and Evaluation (26 hours)
EDUC 684 Statistical Analysis of Educational Data I (three hours)
EDUC 709 Applied Investigations (three hours)
EDUC 783 Measurement (three hours)
EDUC 784 Statistical Analysis of Educational Data II (three hours)
EDUC 785 or approved course - Policy and Program Evaluation (three hours)
EDUC 884 Statistical Analysis of Educational Data III (three hours)
EDUC 994 Dissertation (three hours)
EDUC 994 Dissertation (three hours)

VI. Externship/Internship (24–30 hours)
EDUC 721 Externship in School Psychology, Semester I (three hours)
EDUC 721 Externship in School Psychology, Semester II (three hours)
EDUC 721 Externship in School Psychology, Semester III (three hours)
EDUC 721 Externship in School Psychology, Semester IV (three hours)
EDUC 721 Externship in School Psychology, Semester V (three hours)
EDUC 721 Externship in School Psychology, Semester VI (three hours)
EDUC 721 Externship in School Psychology (Optional) (three hours)
EDUC 721 Externship in School Psychology (Optional) (three hours)
EDUC 821 Doctoral Externship, Semester I (three hours)
EDUC 821 Doctoral Externship, Semester II (three hours)

VII. Foundations (24 hours)
*= *required*

Biological Aspects of Behavior
EDUC 763* Biological Bases of Children's Development (three hours)
PSYC 402 Physiological Psychology (three hours)
PSYC 404 Psychological Applications of Drugs (three hours)
PSYC 504 Health Psychology (three hours)
PSYC 508 Behavior and the Brain: Introduction to Neuropsychology (three hours)
PSYC 701 Behavior and Its Biological Bases I (three hours)
PSYC 703 Advanced Biological Psychology: Central Nervous System
PSYC 705 Behavioral Pharmacology
PSYC 707 Clinical Psychopharmacology
Cognitive and Affective Aspects of Behavior
EDUC 782 Psychology of Learning in the School (three hours)
EDUC 882 Seminar in Human Learning and Cognition (three hours)
PSYC 400 Conditioning and Learning (three hours)
PSYC 430 Human Memory (three hours)
PSYC 435 Topics in Cognition (three hours)
PSYC 461 Cognitive Development (three hours)
PSYC 702 Behavior and Its Biological Bases II (three hours)
PSYC 760 Advanced Cognitive Development (three hours)

Social Aspects of Behavior
EDUC 707* Cross-Cultural Counseling (three hours)
EDUC 776 Gender, Race and Class Issues in Education
PSYC 463 Development of Social Behavior and Personality
PSYC 468 Family as Context for Development
PSYC 562 Applied Social Psychology
PSYC 563 Small Groups
PSYC 565 Stereotyping, Prejudice and Discrimination
PSYC 566 Attitude Change
PSYC 761 Advanced Social Development
PSYC 867 Advanced Survey of Social Psychology
SOCI 444 Race, Class and Gender
SOWO 400 Racism: Implications for Human Services

History and Systems of Behavior
PSCY 790 History of Psychology (three hours)

Human Development
EDUC 681 Human Development
EDUC 781 Theories and Research in Human Development
EDUC 881 Seminar in Human Development and Individual Differences
PSYC 463 Development of Social Behavior and Personality
PSYC 467 The Development of Black Children
SOWO 500 Human Development In Context I: Infancy to Adolescence

Dysfunctional Behavior or Psychopathology
EDUC 762 Child Development and Disability
PSCY 500 Psychological Disorders of Childhood and Adolescence

Professional Standards and Ethics
EDUC 720 Professional Seminar I (three hours)
EDUC 820 Professional Seminar II (three hours)

Licensure

The School of Education recommends eligible graduates of its approved teacher education programs to the North Carolina State Department of Public Instruction for licensure as teachers, administrators, school counselors, school psychologists and curriculum and instruction specialists. In addition, the school recommends licensure candidates from the following University degree programs: the School of Information and Library Science (for school media coordinators), the School of Social Work (for school social workers) and graduates of the speech-language pathology program in the Division of Speech and Hearing Sciences.

The master of arts in teaching and master of education in school counseling prepare students for their initial professional license at the master's and advanced specialist level. The master's for experienced teachers provides the opportunity for practicing teachers to achieve the advanced competencies of master's level licensure in a variety of specialty areas. School administrators are eligible for licensure at the master's and doctoral levels. School psychologists are eligible for licensure at the advanced specialist and doctoral levels. Curriculum and instruction

specialists may earn the add-on license at the master's level or complete an Ed.D. for doctoral-level licensure.

Course Offerings

EDUC 302 [193] STUDY GROUP RESEARCH I (1–3). Prerequisites, EDUC 600, enrollment in the M.Ed. for experienced teachers program. Explores the meanings of research and the potential roles of teachers in conducting research. Teachers formulate possible individual or small group research projects that they can carry out during the year. As demand warrants. Stone.

EDUC 496 [125] INDEPENDENT STUDY (1–3). Prerequisite, permission of the instructor. Provides readings and research under the direction of a faculty member. May be repeated for a maximum of six credit hours. Fall, spring and summer. Staff.

EDUC 567 [105] LITERATURE IN MIDDLE SCHOOL (3). Explores literature in contexts of interdisciplinary middle school curricula and the interests and needs of young adolescents. Topics include reader response theory, censorship, Internet resources, school resources, methods. Fall. Staff.

EDUC 596 [250] INDEPENDENT STUDY MASTER'S LEVEL (1–12). Prerequisite, permission of the instructor. Fall, spring, and summer. Staff.

EDUC 600 [116] REINVENTING TEACHING (3). Prerequisite, admission to the M.Ed. for experienced teachers program. Addresses contexts of teaching, teaching in the world, and teaching students in schools. This course is designed for experienced educators to "reinvent teachers and teaching." As demands warrants. Stone, Grumet.

EDUC 603 [259] THEORY AND RESEARCH IN EDUCATION TECHNOLOGY (3). This course is based on the review and critique of research and theoretical literature in the field of education technology. Students will conduct critical analyses of theory, research and methodology in the field of education technology and design a proposed education technology research study. (Alternate years.) Bolick.

EDUC 605 [205] INTRODUCTION TO STRENGTHS-BASED SCHOOL COUNSELING (3). Introduction to the counseling profession and ethical codes. Primary focus on the history and ethical practice of school counseling, specifically the Strengths-Based School Counseling framework. Summer. D. Brown.

EDUC 606 [206] THEORIES OF COUNSELING (3). Prerequisite, permission of the instructor. Explores current theories of counseling, with emphasis on theory as a means of conceptualizing behavior change in the counseling process. Summer. Galassi.

EDUC 607 [207] PROMOTING CAREER DEVELOPMENT (3). Examines major theories and practices that promote life-career development for K–12 students. Fall. D. Brown.

EDUC 608 [208] PRE-PRACTICUM IN COUNSELING (3). Prerequisites, EDUC 722 (may be taken concurrently), permission of the instructor. Develops interviewing techniques, at specified levels of competence, through role playing and video and audio feedback. Summer. Staff.

EDUC 609 [209] TESTS AND MEASUREMENTS (3). Prerequisite, EDUC 605. Studies basic concepts in measurement and their application in the use and interpretation of tests. The student may be required to purchase tests. Fall. Cizek.

EDUC 610 [210] GROUP COUNSELING PROCEDURES (3). Prerequisite, permission of the instructor. Applies counseling theory and research to the organization and implementation of group counseling. Fall. Staff.

EDUC 611 [211] PRACTICUM IN SCHOOL COUNSELING (1–21). Prerequisites, EDUC 606, 608, permission of the instructor. Develops individual counseling skills and an understanding of the school as a setting for counseling through an apprenticeship experience. Fall. Akos, Brown, Galassi.

EDUC 612 [118] SOCIAL STUDIES AND ARTS (1–9). Looks at social studies as a discipline that easily integrates other disciplines, particularly the arts, which includes literature. It emphasizes curriculum and instruction, as well as theoretical underpinnings.

EDUC 613 [173] CULTURALLY RESPONSIVE TEACHING (2). This course initiates thoughtful discussion of race and culture in our schools by exploring history, identity, and issues in academic achievement.

EDUX 616 [174] TEACHING AND DIFFERENTIATION (2). Prerequisites, enrollment in the M.Ed. for experienced teachers program. Enhances teachers' understanding of how to differentiate instruction. Using a case-based approach, teachers examine the areas of human development, special education and inclusion, cultural diversity, linguistic diversity, cognitive styles and multiple intelligences as frames through which to consider creative environments to promote students' classroom success. As demand warrants. Staff.

EDUC 617 [128] INTRODUCTION TO COMMUNICATION DISORDERS (COMM 617) (3). Explores the etiology, epidemiology, assessment and educational implications of speech and language disorders. As demand warrants. Staff.

EDUC 620 [122] INTRODUCTION TO SCHOOL PSYCHOLOGY (3). Introduces the student to concepts and methods involved in school psychology. As demand warrants. Staff.

EDUC 621 [115G] EXPLORATIONS IN LITERACY (3). Explores what it means to be a reader and writer, the nature of development of literacy. Fall. Hall, Ferrara.

EDUX 622 [126] CONTENT-AREA READING AND WRITING (3). Focuses on current theory, research and issues in the teaching and use of reading and writing in the content areas. This is an introductory course. Spring. Hall.

EDUC 626 [106] PEDAGOGICAL ENGLISH GRAMMAR FOR ESL TEACHERS (3). Enhances foreign and second language educators' understanding of English grammar, expands their skills in linguistic analysis and helps them develop a more pedagogically sound approach to the teaching of English grammar. Spring. Heining-Boynton.

EDUX 626 [EDUC 121] REVISITING REAL NUMBERS CONCEPTS (3). Uses a problem-based format and group work to explore the mathematics of the real numbers with an emphasis on rational numbers. As demand warrants. Staff.

EDUC 627 [107] PEDAGOGICAL LINGUISTICS FOR ESL TEACHERS (3). Provides future English as a second language teachers with advanced concepts in linguistics and comparative linguistics. Topics such as phonology and morphology will be covered. Spring. Hart, Heining-Boynton.

EDUC 628 [109] METHODS OF TEACHING ENGLISH AS A SECOND LANGUAGE (3). Covers teaching methods, assessment and resource issues related to helping the ESL learner. Additional topics include theories of language learning and the relationships between culture and language. As demand warrants. Kubota.

EDUC 629 [150] LANGUAGE MINORITY STUDENTS: ISSUES FOR PRACTITIONERS (ANTH 629) (3). Permission of the instructor. Explores issues of culture and language associated with teaching English as a second language. Fall. Kubota, Villalva.

EDUC 631 [131] PROGRAM DEVELOPMENT FOR SPECIAL POPULATIONS (3). Permission of the instructor. Reviews issues associated with program development for children who are experiencing uneven success in school because of poor attendance, poverty, drug and alcohol abuse, disabling conditions, parental abuse or violent behaviors. Fall. W. Malloy.

EDUC 632 [338] PROBLEMS OF SUPERVISORY PRACTICE (3). Prerequisite, admission to the master of school administration program. Focuses on the role of school administrators in facilitating the continuous improvement of the clinical supervision process and on a variety of observation and conferencing skills that school leaders may employ with teachers and other support staff. (On request.) Veitch.

EDUC 633 [234] THE SOCIAL CONTEXT OF EDUCATIONAL LEADERSHIP (4). Provides retrospective, contemporary and prospective examinations of the social, cultural, political and philosophical contexts from which the current issues that affect schools and schooling have evolved. Fall. K. Brown.

EDUC 634 [139] CURRICULUM LEADERSHIP (3). Examines theories and related practices of applied curriculum leadership including curriculum planning based on selected trend data, high-risk accountability systems, topological/deep curriculum alignment options and issues and curriculum audits and classroom curriculum "walk-throughs." Fall and spring. English.

EDUC 635 [336] PROBLEMS IN EDUCATIONAL ADMINISTRATION (3). Prerequisite, permission of the instructor. Provides an opportunity for advanced students to do independent study under supervision. May be repeated for credit. Fall and spring. Schainker.

EDUC 636 [132] SCHOOL REFORM AND CHANGE (3). Introduces effective strategies and tactics for changing schools, varieties of school restructuring, importance of multicultural education and client-friendly school environments in site-based organizations. Fall and spring. Shipman, Tillman.

EDUC 637 [133] PERSONNEL ADMINISTRATION AND LAW (3). Examines the quantitative and qualitative research methodologies appropriate to school settings; evaluation of research and its application to schools. Spring. Staff.

EDUC 638 [238] MANAGING SCHOOLS WITHIN A DISTRICT CONTEXT (3). Prerequisites, EDUC 834, permission of the instructor. Examines the processes of management and their relationship to the success of the instructional programs in schools and school systems. Fall and spring. Schainker.

EDUC 641 [141] INTRODUCTION TO TEACHING (3). Prerequisite, admission to the M.A.T. program. Introduces the principles of effective teaching with emphasis on the first year of teaching. Summer. Staff.

EDUC 642 [142] INTRODUCTION TO SCHOOLS (3). Prerequisite, admission to the M.A.T. program. Provides an examination and overall view of schools that introduces topics such as the cultures of schools, professionalism, connections with other communities, multiculturalism and special populations. Summer. Staff.

EDUC 644 [144] LEARNER AND LEARNING I (3). Prerequisites, EDUC 641 and 642. Provides prospective teachers a conceptual understanding of child/adolescent development in order to enable them to interpret student behavior in a valid manner. Fall. Hamm.

EDUC 645 [145] CONTEXTS OF EDUCATION I (3). Prerequisites, EDUC 641, 642, permission of the instructor. Focuses on the social contexts of schools, conditions of teaching, relations between students, teachers and administrators, equitable educational opportunity, and educational philosophies. This course is part one of a two-course sequence. Fall. Stone, Levine.

EDUC 646 [146] PRACTICA STUDENT INTERNSHIP (3). Prerequisites, EDUC 641, 642. Provides students the opportunity to observe and become involved with all aspects of teaching and schools within their content area. Fall. Staff.

EDUC 647 [147] METHODS AND MATERIALS FOR TEACHING SECONDARY/K–12 SUBJECTS I (3). Prerequisites, EDUC 641 and 642. Prepares students to teach the English language arts at the secondary level. The immediate purpose of this course is to prepare participants for full-time student teaching during the spring semester. Fall. Trier, Rong, Heining-Boynton, Huff, Kubota, C. Malloy, Villalva.

EDUC 648 [148] METHODS AND MATERIALS FOR TEACHING ELEMENTARY MUSIC I (3). Prerequisites, EDUC 641 and 642. Equips students with the resources and experiences to facilitate entry as a specialist in the elementary music classroom. Fall. Raley.

EDUC 652 [151] PRINCIPLES OF INSTRUCTIONAL DESIGN (3). Studies the design and production of instructional materials incorporating goal analysis, learning task analysis, behavioral objectives, entry behavior, criterion tests, instructional strategies, design planning and formative evaluation. Fall. Hannum.

EDUX 657 [EDUC 115E] SOCIAL STUDIES/HUMANITIES (1–9).

EDUX 658 [EDUC 195G] DIVERSITY GLOBAL EDUCATION (1–9).

EDUC 662 [162] EMERGENT LITERACY (3). This course focuses on the development of literacy processes (reading and writing) at the birth through first grade level. Means of nurturing emergent literacy are represented and explored for parents, early caregivers and preschool through first grade teachers. Students will practice literacy-based activities in preschool and kindergarten programs throughout the semester. Fall. Ferrara.

EDUC 664 [164] FAMILIES AND TEAMS IN EARLY CHILDHOOD INTERVENTION: INTERDISCIPLINARY PERSPECTIVES (3). Open to graduate students only. Explores issues and models of family-professional and interprofessional relationships in early childhood settings. Collaborative communication and problem solving strategies are emphasized in the context of diversity. Summer, and as demand warrants. Boone.

EDUC 665 [165] EARLY CHILDHOOD ASSESSMENT STRATEGIES (3). Open to graduate students only. Provides an overview and application of strategies for developmental screenings, normative evaluations, curriculum and play-based assessments for young children ages birth through five. Fall. Boone, Gallagher.

EDUC 666 [166] PRESCHOOL/KINDERGARTEN CURRICULUM AND LEARNING ENVIRONMENTS (3). Open to graduate students only. Focuses on individually, developmentally and culturally appropriate learning environment and curriculum strategies for young children with and without disabilities ages three to five. Fall. Boone.

EDUC 667 [167] INFANT/TODDLER CURRICULUM AND LEARNING ENVIRONMENT (3). Focuses on infant/toddler development and mental health strategies for facilitating development in the home and in child care. Summer. Boone, staff.

EDUC 668 [168] B-K INTERNSHIP (1–2). Provides an opportunity for students to synthesize and apply research and recommended practices in their work settings or in an assigned internship setting. Fall, spring and summer. Staff.

EDUC 672 [178] SEMINAR IN EDUCATIONAL STUDIES (3). Focuses on educational issues involving culture, curriculum and change. Issues addressed will vary. Fall. Staff.

EDUX 675 [EDUC 209B] SEMINAR IN SCIENCE EDUCATION (3). Teaches students curriculum and instruction strategies in science education. The focus of the course is on teaching and assessing science for conceptual understanding.

EDUC 676 [274B] TRANSFORMATIONAL EDUCATION (3).

EDUX 676 [EDUC 115D] PERSPECTIVES ON SCIENCE EDUCATION: PHYSICAL SCIENCE (3). Examines physical science domains in depth. Students reflect on their own understandings of science phenomena and research their students' understandings.

EDUC 678 [278] SEMINAR IN EDUCATIONAL STUDIES (3). Focuses on educational issues and theories involving culture, curriculum and change. Issues and theories addressed will vary. Fall and spring. Staff.

EDUX 677 [EDUC 119A] PERSPECTIVES ON SCIENCE EDUCATION: LIFE SCIENCE (3). Studies the history of science education, curriculum design and national reform ideas as well as projects and programs currently used in U.S. classrooms.

EDUC 681 [181] HUMAN DEVELOPMENT (3). Open only to majors in the School of Education. Emphasizes theories of child and adolescent development plus research findings that aid in the understanding of human behavior and development. As demand warrants. Meece.

EDUC 682 [130] BEHAVIORAL SUPPORT TECHNIQUES (3). Emphasizes effective behavior management and applied behavior analysis techniques for intervening in the environments of exceptional children to increase learning. As demand warrants. Staff.

EDUC 683 [183] EDUCATIONAL MEASUREMENT AND EVALUATION (3). Identifies the basic concepts in measurement and evaluation, describes the role of evaluation in curriculum construction and revision, and describes the development and use of teacher-constructed tests. Fall. Cizek.

EDUC 684 [184] STATISTICAL ANALYSIS OF EDUCATIONAL DATA I (4). Studies descriptive and inferential statistics for educational research, including an introduction to fundamentals of research design and computer data analysis. Fall, summer. Cizek, Ware.

EDUC 686 [186] THE PSYCHOLOGY OF ADULT LEARNING (3). Focuses upon knowledge and application of learning principles and conditions for facilitating learning in adults. Fall or spring. Frierson, Hannum.

EDUC 695 [127] INTRODUCTION TO EXCEPTIONAL CHILDREN (3). Surveys giftedness and various disabling conditions: mental retardation, emotional disturbance, learning disabilities, speech impairment, hearing impairment, vision impairment, orthopedic impairment and neurological impairment. Fall, spring and summer. Staff.

EDUX 695 [EDUC 294D] PROBLEM MATH TASKS (1–3).

EDUC 696 [326] INDEPENDENT STUDY DOCTORAL LEVEL (1–12). As demand warrants. Staff.

EDUX 699 [EDUC 193] STUDY GROUP RESEARCH I (1–3).

EDUX 700 [EDUC 292] TEACHER RESEARCHER II (1–3).

EDUC 701 [120] LITERACY REFLECTION (3).

EDUX 701 [EDUC 295] TEACHER LEADERSHIP AND DEMOCRATIC SCHOOLING (3).

EDUX 703 [EDUC 294A] REVISITING LITERACY (3). Explores literacy topics as capstone course for master's or licensure program in literacy. Spring. Ferrara.

EDUC 705 [212] INTERNSHIP IN SCHOOL COUNSELING AND CONSULTATION (3–9). Prerequisites, EDUC 606, 608, permission of the instructor. Places students in counseling and consultation under supervision in a school setting in order to develop competencies in individual counseling, group counseling, and consultation. May be repeated for credit for a maximum of 12 credit hours. Spring. Akos, D. Brown, Galassi.

EDUC 706 [213] ISSUES IN ORGANIZING GUIDANCE SERVICES (3). Prerequisite, 18 hours in counseling courses. Emphasizes organizing guidance services to meet such problems as those related to the special needs of women, minority groups and the drug problem. Summer. D. Brown.

EDUC 707 [214] CROSS-CULTURAL COUNSELING (3–6). Prerequisite, permission of the instructor. Explores the cognitive and affective considerations of counseling in culturally different social systems. This includes ways to incorporate specific sociocultural dimensions into the counseling process. Spring. Moore.

EDUC 708 [215] SCHOOL CONSULTATION METHODS (3–12). Examines various models of consultation and the role of the consultative model in the schools and related agencies; uses role playing and experience in the school. May be repeated for credit. Spring. D. Brown, Knotek.

EDUC 709 [216] SEMINAR IN APPLIED INVESTIGATIONS (3). Prerequisite, permission of the instructor. Provides opportunities to explore specific areas of research interest in counseling and school psychology in depth. Fall, some springs and summer. Galassi, O'Sullivan, Simeonsson, Wasik.

EDUC 710 [217] PSYCHOLOGY OF CAREER DEVELOPMENT (3). Reviews theories and research in the psychology of career development and counseling. Emphasis is on theory and implications for practice. Open to doctoral students. Fall. D. Brown.

EDUC 718 [221] PSYCHOEDUCATIONAL ASSESSMENT (1–3). Prerequisite, permission of the instructor. Addresses knowledge and skills in techniques of observation, interviewing, assessment of environment, intelligence, achievement, perceptual motor skills and interpersonal perceptions. May be repeated for credit. Fall and spring. Brantley, Simeonsson.

EDUC 719 [222] BEHAVIORAL INTERVENTION IN COUNSELING AND SCHOOL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Covers behavior management and therapy as well as individual and group therapy. (The school psychology sections include consideration of theoretical interventions beyond those of a behavioral perspective.) May be repeated for credit. Fall and spring. Knotek, Simeonsson, Wasik.

EDUC 720 [223] SEMINAR IN PROFESSIONAL SCHOOL PSYCHOLOGY (2–3). Deals with the goals and roles of school psychology, ethical concerns, privileged information, certification and licensing, and other relevant areas. May be repeated for credit. Fall. Brantley.

EDUC 721 [224] EXTERNSHIP IN SCHOOL PSYCHOLOGY (1–6). Prerequisite, permission of the instructor. Provides supervised observation and participation in school psychological services in schools and school-related field facilities. May be repeated for credit. Fall and spring. Brantley, Knotek, Simeonsson, Wasik.

EDUC 722 [226] MASTER'S INTERNSHIP IN SCHOOL PSYCHOLOGY (1–6). Prerequisites, EDUC 721 and permission of the instructor. Provides supervised full-time field experience for master's students in school psychology in a school setting. Fall, spring, and summer. Brantley, Wasik.

EDUX 722 [EDUC 201] ADVANCED REFLECTIVE LITERACY TEACHING (3).

EDUC 723 [227] ADVANCED ASSESSMENT AND INTERVENTION APPROACHES FOR STUDENTS WITH TRAUMATIC BRAIN INJURY (3).

EDUC 726 [143] PRACTICA IN SECOND LANGUAGES (1). Provides students an opportunity to observe and become involved with all school aspects of teaching and learning second/foreign languages. Open by permission of the instructor. Fall. Heining-Boynton, Kubota, Villalva.

EDUX 727 [117] TOPICS IN ALGEBRA (3).

EDUC 728 [241] PRACTICUM IN ESL II/FOREIGN LANGUAGES (3). Provides an internship to teach ESL/FL under the supervision of an experienced ESL teacher. Spring. Heining-Boynton, Kubota, Villalva.

EDUC 729 [269] CULTURE AND POLITICS IN SECOND LANGUAGE EDUCATION (3). This course provides an overview of current issues in second language teaching (ESL, foreign languages and bilingual education) with a focus on culture, politics and diversity. Spring. Kubota, Villalva.

EDUC 731 [337] PROBLEMS IN EDUCATION LEADERSHIP II (3). Prerequisite, permission of the instructor. Emphasizes school improvement planning, school-based budgeting, professional development and technology. Fall and spring. Veitch.

EDUC 732 [140] GROUP DYNAMICS, DECISION MAKING, AND PROBLEM SOLVING (3). Develops understanding and skills for working with various organizational groups. Focus is on teams, leadership of teams, team problem solving, and team decision making. Spring. Schainker.

EDUC 734 [233] PLANNING IN EDUCATIONAL ORGANIZATIONS (3). Examines a conceptual and practical approach to planning in educational organizations. Includes a focus on environmental scanning, futures research, and strategic planning. Fall. English.

EDUC 735 [134] INTERNSHIP SEMINAR ON INSTRUCTIONAL LEADERSHIP AND SUPERVISION (3). Relates internship experiences and applications about instructional design techniques of teaching/learning, evaluation of the teaching/learning process, and ways in which school-based leaders can support excellence in education. Fall. Veitch, Schainker.

EDUC 736 [137] SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION I (3–6). Provides supervised internship in school administration to facilitate the student's progress toward certification in the principalship. May be repeated for credit. Fall. Staff.

EDUC 737 [135] INTERNSHIP SEMINAR ON SCHOOL BUILDING MANAGEMENT (3). Prerequisites, six semester hours in educational administration, including EDUC 834, and permission of the instructor. Relates internship experiences and applications of school business management practices (transportation, food services, plant planning, etc.) to schools. Spring. Veitch, Schainker.

EDUC 738 [138] SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION II (3–6). Provides supervised internship in school administration to facilitate the student's progress toward certification in the principalship. May be repeated for credit. Prerequisites, six semester hours in educational administration, including EDUC 834, and permission of the instructor. Spring. Staff.

EDUC 739 [273] EDUCATIONAL POLICY STUDIES (3).

EDUC 743 [248] TEACHING SECONDARY STUDENTS WITH DISABILITIES (1). Following a case format and utilizing online instruction, M.A.T. students learn to teach secondary learners in inclusion settings. Spring. Staff.

EDUC 744 [242] LEARNER AND LEARNING II (2). Prerequisites, EDUC 644. Provides basic psychological principles upon which prospective teachers can design effective instructional programs and validly assess these programs of instruction. Spring. Hamm.

EDUC 745 [243] CONTEXTS OF EDUCATION II (2). Prerequisite, EDUC 645. Provides a weekly seminar (part two of a two-semester sequence) for interns with full-time teaching responsibilities. Interns will connect their teaching experience to social, cultural and philosophical issues in education. Spring. Stone, Levine.

EDUC 746 [244] PRACTICA STUDENT INTERNSHIP (9). Provides full-time internship in teaching in the content area under the supervision of experienced teachers and a university supervisor for the semester. Open by permission of the instructor. Spring. Staff.

EDUC 747 [245] METHODS AND MATERIALS FOR TEACHING SECONDARY/K–12 SUBJECTS II (2). Teaches intern social studies teachers to be aware of trends and issues in social studies in North Carolina and the nation, therefore improving their understanding and skills in curriculum development and instruction. Spring. Rong, Trier, C. Malloy, Heining-Boynton, Huff, Kubota, Villalva.

EDUC 748 [247] ADVANCED PEDAGOGY (3). Prerequisite, admission into the M.A.T. program. "Advanced Pedagogy" is the first course of a two-course module that completes that M.A.T. year-long program of study. The module emphasizes advanced licensure preparation. Summer. Staff.

EDUC 749 [249] CURRICULUM LEADERSHIP (3). Prerequisite, admission into the M.A.T. program. Curriculum Leadership is the second course in the summer capstone experience for M.A.T. students that is taken concurrently with Advanced Pedagogy. The module emphasizes advanced licensure preparation. Summer. Staff.

EDUC 752 [252] INSTRUCTIONAL THEORIES (3). Prerequisites, a prior course on learning and permission of the instructor. Examines the nature and application of various theories of instruction to instructional goals, individual differences, teaching strategies, sequencing, motivation and assessment. As demand warrants. Bolick.

EDUC 753 [153] INTRODUCTION TO CURRICULUM (3). Surveys the nature of curriculum development and contemporary changes as they relate to social aims, learner characteristics and social problems. Open to graduate students in education or by permission of the instructor. As demand warrants. Grumet.

EDUC 754 [254] TEACHER EDUCATION IN THE UNITED STATES (3). Studies the research relating to teacher effectiveness and programs for the preparation of teachers. Designed for students planning to work in teacher education. As demand warrants. Rogers, Glazier.

EDUC 756 [256] PRINCIPLES AND METHODS IN PARENT EDUCATION AND INVOLVEMENT (3). Examines principles, theory, models and methods for work with parents and families in educational settings, with relevant research and practical applications. As demand warrants. Staff.

EDUC 757 [257] COLLEGE TEACHING (3). Introduces students to the planning of courses and educational programs for college students. Emphasis is on a systematic approach to developing, implementing and evaluating instruction. This course is intended for graduate students in any academic department who plan teaching careers. As demand warrants. Staff.

EDUX 757 [EDUC 198A] SOCIAL STUDIES PEDAGOGY A (1–9).

EDUC 758 [258] IMMIGRATION AND EDUCATION (3). Investigates social (including political, economic, legal and demographic) and cultural impacts on immigration and education. Spring. Rong.

EDUX 758 [EDUC 198B] SOCIAL STUDIES PEDAGOGY B (1–9).

EDUX 759 [EDUC 195B] CONTEMPORARY RESEARCH FOR SOCIAL STUDIES TEACHING (1–9).

EDUX 760 [EDUC 294C] INTEGRATED LEARNING (3).

EDUC 761 [261] PROFESSIONAL DEVELOPMENT AND LEADERSHIP IN EARLY CHILDHOOD INTERVENTION (3). Prerequisites, EDUC 664, 665 and 666. Focuses on leadership skills in mentoring, supervision. staff development, resource gathering and applied research related to early childhood settings. Spring. Boone, staff.

EDUC 762 [169] CHILD DEVELOPMENT AND DISABILITY (3). Emphasizes typical development and developmental deviation exhibited by children in cognitive, language, social and affective areas. Spring. Simeonsson, staff.

EDUC 763 [263] BIOLOGICAL BASES OF CHILDREN'S DEVELOPMENT (3). Focuses on the theory and research related to the biomedical and psychological aspects of exceptionality. Fall. Simeonsson.

EDUC 764 [282] CURRENT ISSUES IN LITERACY (3).

EDUC 768 [268] EDUCATION IN LATIN AMERICA (LTAM 768) (3). Introduction to education and social issues in Latin America. Explores the relationship between national development and education. The course will include case studies of individual nations as well as issues embracing the region as a whole. Fall. Cortina.

EDUC 769 [267] SCHOOLING OF LATINOS (LTAM 767) (3). Explores assimilation, educational achievement, persistence in school, language and the schooling of Latinos in the United States. Fall. Cortina.

EDUC 770 [270] MULTICULTURAL WAYS OF KNOWING (3).

EDUC 771 [171] SEMINAR IN SOCIAL FOUNDATIONS OF EDUCATION (1). Explores topics in the social and philosophical context of American public education. Spring. Staff.

EDUC 772 [271] EDUCATIONAL SOCIOLOGY (3). Applies sociological theory and research to problems of concern to educators. Spring. Noblit.

EDUC 773 [272] SOCIAL CHANGE AND EDUCATION (3). Analyzes social change within a theoretical framework and describes its probable impact on education. Considers the role of the school in the development of human capital. As demand warrants. Staff.

EDUC 774 [274] SOCIAL AND EDUCATIONAL HISTORY OF THE UNITED STATES (3). Provides a survey of the social forces influencing the development of American education from the period of colonization to the early years of the 20th century. Spring. Levine.

EDUC 775 [280] INTRODUCTION TO ETHICS AND EDUCATION (3). Identifies issues arising in the professional activities of education personnel in the context of systematic consideration of the nature of ethical choice. Fall, summer. Stone.

EDUC 776 [276] GENDER, RACE AND CLASS ISSUES IN EDUCATION (WMST 776) (3). Provides an understanding of (and remedies for) the racism, sexism, and class divisions that schools can perpetuate. Examines curriculum, counseling and interaction in classrooms; structure and leadership; and fundamental assumptions. As demand warrants. Staff.

EDUC 777 [277] GENDER, POLICY AND LEADERSHIP IN EDUCATION (WMST 777) (3). Covers feminist critiques of organizational and political power structures in readings and discussions leading to group and individual research projects. As demand warrants. Marshall.

EDUX 778 [EDUC 203A] SCIENCE EDUCATION: EARTH/SPACE/ENVIRONMENT (3).

EDUC 779 [279] INTRODUCTION TO PHILOSOPHY OF EDUCATION (3). Provides a comparative study of current philosophies of education, with particular attention to their impact on solutions offered to problems currently recognized in American education. As demand warrants. Stone.

EDUX 779 [EDUC 119B] BIG IDEAS IN SCIENCE EDUCATION (3).

EDUC 781 [281] THEORIES AND RESEARCH IN HUMAN DEVELOPMENT (3). Prerequisite, permission of the instructor. Covers the basic theories and the research bases for instructional decisions. This is an advanced-level course in human development. Spring. Hamm, Meece.

EDUC 782 [182] PSYCHOLOGY OF LEARNING IN THE SCHOOL (3). Studies learning in the school setting, with emphasis on fundamental concepts, issues and evaluation of materials and experiences. Fall and spring. Meece.

EDUC 783 [283] APPLIED MEASUREMENT THEORY FOR EDUCATION (3). An examination of the logic and theory of educational measurement. Practical applications of measurement theory to the construction and use of a variety of educational measurement devices. Spring. Cizek.

EDUC 784 [284] STATISTICAL ANALYSIS OF EDUCATIONAL DATA II (4). Prerequisite, EDUC 684 or permission of the instructor. A linear model approach to the analysis of data collected in educational settings. Topics include multiple regression, analysis of variance and analysis of covariance, using computer packages. Spring, summer. Ware.

EDUC 785 [285] PROGRAM EVALUATION IN EDUCATION (3). Prerequisites, EDUC 684 and 871. An examination of major approaches to program evaluation with emphasis on differences between evaluation and research. Fall and spring. Frierson.

EDUC 786 [289] PROBLEMS IN EDUCATIONAL PSYCHOLOGY (3-6). Prerequisite, permission of the instructor. Study and development of original investigations in the area of educational psychology. Fall, spring and summer. Cizek, Frierson, Hamm, Meece.

EDUC 787 [290] PROBLEMS IN EDUCATIONAL MEASUREMENT (3). Prerequisites, EDUC 684, 783, permission of the instructor. Provides an opportunity for advanced doctoral students to study a particular problem area in educational measurement under the supervision of a faculty mentor. May be repeated for credit. Fall, spring and summer. Cizek, Frierson, Ware.

EDUC 792 [286] EMERGING TECHNOLOGIES (3).

EDUX 794 [EDUC 115A] DEVELOPING MATHEMATICAL KNOWLEDGE (1–3).

EDUC 795 [155] SEMINAR IN LEARNING DISABILITIES EDUCATION (3). Prerequisites, EDUC 687, EDUC 688 (may be taken concurrently with EDUC 688). (Students enrolled in the licensure-only program require initial competencies with regard to law and assessment that are not currently available). Instructs students about the requirements of the Individuals with Disabilities Education Act (IDEA) and case law, particularly those pertaining to learning disabilities. Students will also learn the basics of measurement concepts (reliability, validity, error, etc.). Fall. Farmer.

EDUC 796 [156] PROBLEMS IN SPECIAL EDUCATION (3). Prerequisite, permission of the instructor. Provides an opportunity for post-master's students who wish to engage in supervised field and pilot research. May be repeated for credit. Fall, spring and summer. Staff.

EDUX 796 [EDUC 197B] PROBLEM-BASED LEARNING IN MATHEMATICS (1–3).

EDUC 797 [159] COLLABORATION WITH FAMILIES AND OTHER PROFESSIONALS (3). Instructs students about the resources available to them, their students and their students' families. Students will develop skills in working with parents and professionals as partners in the instruction and planning of programs for students with learning disabilities. As demand warrants. Farmer.

EDUC 798 [160] MASTER'S INTERNSHIP IN LEARNING DISABILITIES EDUCATION (3). Prerequisites, EDUC 795, EDUC 687, EDUC 688. (May be taken concurrently with EDUC 688). Provides supervised experience in a phase of special education or literacy studies appropriate to the student's qualifications and future educational goals. Requires a minimum of three hundred clock hours at the internship site per semester. Fall, spring, and summer. Staff.

EDUC 801 [301] FUNDAMENTALS OF EDUCATIONAL RESEARCH (3). Explores and analyzes the range of educational research designs including experimental, correlational, survey, descriptive, case study, ethnography, narrative, policy and longitudinal research. Fall. Meece, Vernon-Feagans.

EDUC 802 [302] FOUNDATIONS OF EDUCATIONAL RESEARCH (3). Applies the philosophies of science, social science, language, and history (including recent theoretical issues) to the understanding of how educational research is conducted and what contribution it makes. Spring. Stone.

EDUC 803 [300] PROSEMINAR IN EDUCATION (3). Students develop an in-depth understanding of scholarly traditions within education, histories of curricular area and current issues facing these areas and education as a whole, and application of these histories and issues to classrooms and schools. Fall. Noblit.

EDUC 804 [304] SEMINAR IN CULTURE, CURRICULUM AND CHANGE (3). Critical examination of topics and policy issues related to curriculum and educational change, considered in cultural context. Open to doctoral students. Fall. Staff.

EDUC 805 [305] SEMINAR IN EARLY CHILDHOOD, FAMILIES AND LITERACY (3). Critical examination of topics related to the development of young children and early literacy, and the role of families in this development. Open to doctoral students. Fall. Staff.

EDUC 806 [306] SEMINAR IN PSYCHOLOGICAL MEASUREMENT AND EVALUATION (3). Critical examination of theoretical and research issues related to learning, development, teaching, assessment and quantitative methods of research, from a psychological perspective. Open to doctoral students. Fall. Hamm.

EDUC 811 [311] PROBLEMS IN SCHOOL COUNSELING (1–21).

EDUC 812 [312] DOCTORAL PRACTICUM IN SCHOOL COUNSELING (1–21).

EDUC 813 [313] DOCTORAL INTERNSHIP IN SCHOOL COUNSELING (1).

EDUC 814 [814] SUPERVISION AND TEACHING IN SCHOOL COUNSELING (3).

EDUC 815 [315] DOCTORAL SEMINAR IN SCHOOL COUNSELING (3).

EDUC 820 [225] DOCTORAL SEMINAR IN PROFESSIONAL SCHOOL PSYCHOLOGY (3). Prerequisites, appropriate courses and permission of the instructor. Considers advanced topics in the field of school psychology such as professional issues, standards and ethics, and interdisciplinary relations. Fall. Brantley.

EDUC 821 [321] DOCTORAL EXTERNSHIP IN SCHOOL PSYCHOLOGY (1–6). Prerequisite, permission of the instructor. Supervised field placement experiences for doctoral-level students in school psychology, integrating training with field responsibilities at a systems level in schools and school-related settings. Fall and spring. Staff.

EDUC 831 [231] SCHOOL LAW: JUSTICE AND EQUITY (3). Prerequisite, six semester hours of graduate school work in school administration. Provides an overview of the legal structure of education, liability, constitutional rights, contractual relationships, federal regulations and collective action. May be repeated for credit. Fall. F. Brown.

EDUC 832 [235] EDUCATIONAL POLITICS AND POLICY (3). Examines theory of competing conceptions of policy. Actors and agencies are examined at federal, state and local levels. Interactions across levels are studied in relation to current policy alternatives. Fall. Marshall.

EDUC 833 [236] LEADING SYSTEM FUNCTIONS (3). Prerequisites, EDUC 839, EDUC 842, permission of the instructor. This course is focused on the issues pertaining to personnel, planning, facilities, administrative applications of technology, superintendent/board relations, district-level curriculum and assessment issues, and creating and sustaining community inter-agency partnerships. Spring. Staff.

EDUC 834 [237] ORGANIZATIONAL BEHAVIOR AND THEORY IN EDUCATION (3). Prerequisite, permission of the instructor. Analyze the theoretical assertions and empirical knowledge claims that have led to the dominant structures, power relationships and performance expectations of American schools. Fall. F. Brown.

EDUC 835 [239] INSTRUCTIONAL LEADERSHIP FOR SUPERVISION, CURRICULUM AND TECHNOLOGY (3). Provides fundamental knowledge of instructional design, techniques of teaching/learning, evaluation of the teaching/learning process, and ways in which school-based leaders can support excellence in classroom instruction. Fall and spring. English.

EDUC 836 [240] SCHOOL FINANCE AND ECONOMIC EQUITY (1–3). Covers the area of financing school corporations in the current economic and political setting, with emphasis on the interrelationships of educational, economic and political decisions. May be repeated for credit. Fall and spring. F. Brown.

EDUC 838 [232] SCHOOL GOVERNANCE (3). Prerequisite, permission of the instructor. Focuses on governance and policy at the school building level and how district-wide governance, state educational policy, federal involvement in education, and educational special interest groups impact school-sized governance. Fall and spring. Staff.

EDUC 839 [331] THE EXCELLENT SCHOOL SEMINAR I (3). Prerequisite, permission of the instructor. Research and models on high-performing organizations, instructionally effective schools and school systems, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Fall. Staff.

EDUC 840 [333] ADVANCED LEADERSHIP THEORIES (3). Prerequisites, EDUC 633, 638, 832 and 834. Requires students to integrate previous studies to focus on management applications, dilemmas and conflicts. Spring. English.

EDUC 841 [334] THE DEVELOPMENT OF A RESEARCH PROPOSAL (3). Prerequisites, EDUC 633, 832 and 834. Requires students to integrate previous studies to focus on theory, inquiry, and organizational practice. Spring. English.

EDUC 842 [332] THE EXCELLENT SCHOOL SEMINAR II (3). Prerequisite, permission of the instructor. Research and models on high-performing organizations, instructionally effective schools and school systems, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Spring. Staff.

EDUC 844 [335] ADVANCED SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION (1–6). Prerequisites, EDUC 633, 638, 832, 834, permission of the instructor. An advanced internship and seminar relevant to the program in administration and to the student's progress toward advanced administrative certification. May be repeated for credit. Fall, spring and summer. W. Malloy.

EDUC 851 [251] CURRICULUM THEORY (3). Relates curriculum development to relevant theories and research in humanistic and behavioral studies. This is an advanced course. As demand warrants. Grumet.

EDUC 852 [253] INSTRUCTIONAL SYSTEMS DEVELOPMENT (3). Delineates strategies for developing instructional systems, including needs assessment, job analysis, goal setting, use of criterion tests, delivery systems, project management and evaluation of learners and programs. As demand warrants. Hannum.

EDUC 853 [255] SUPERVISION AND INSTRUCTION (3). Examines the history, nature, and purposes of educational supervision, with an emphasis on the supervisor's role in improving teaching, curriculum development and staff development. Spring. Day.

EDUC 854 [351] RESEARCH IN CURRICULUM AND INSTRUCTION (3). Prerequisites, EDUC 753, 515, 851, 752, 784, or permission of the instructor. Review and interpretation of existing research in the area of curriculum and instruction, including an exploration of areas of needed research. Spring. Staff.

EDUC 855 [352] PROBLEMS IN CURRICULUM AND INSTRUCTION (3–6). Prerequisites, two courses in graduate education. May be repeated for credit. Provides an opportunity for advanced students to do independent study under supervision in an area of study. (Sections include early childhood, intermediate, secondary subjects, media, literacy, and general.) Fall and spring. Staff.

EDUC 856 [353] PRACTICUM IN CURRICULUM AND INSTRUCTION (3–6). Experiences may include projects, field studies or internships with one of a number of agencies concerned with education. (Sections include early childhood, intermediate, secondary subjects, media, literacy and general.) Fall and spring. Staff.

EDUC 861 [361] SEMINAR IN SPECIAL EDUCATION (3). Emphasis on developmental deviation exhibited by exceptional children in cognitive, language, social and affective development. Spring. Simeonsson.

EDUC 862 [365] TEACHING AND PERSONNEL DEVELOPMENT (SPHS 862) (3).

EDUC 863 [363] SUPERVISED POST-MASTER'S INTERNSHIP IN SPECIAL EDUCATION (3, 6 or 9). Prerequisite, permission of the instructor. A full-time field placement under the joint direction of a University staff member and a selected professional at the internship site. Fall and spring. Staff.

EDUC 864 [364] FAMILIES, SCHOOLS AND CHILD DEVELOPMENT: SUCCESSFUL INTERVENTION STRATEGIES (3).

EDUC 871 [329] SEMINAR IN EDUCATION (3). Provides for seminar treatment of appropriate topics. Prerequisites, two courses in graduate education and permission of the instructor. (As demand warrants.) Staff.

EDUC 872 [372] SEMINAR IN EDUCATIONAL STUDIES (3-6). May be repeated for credit. Topics in educational philosophy to be determined by the students with the instructor. As demand warrants. Stone.

EDUC 873 [373] PROBLEMS IN THE PHILOSOPHICAL FOUNDATIONS OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisite, EDUC 779 or equivalent. As demand warrants. Stone.

EDUC 874 [374] PROBLEMS IN THE SOCIOLOGICAL FOUNDATIONS OF EDUCATION (3 or more). Prerequisite, EDUC 772 or equivalent. Provides an opportunity for advanced doctoral students to do independent study under supervision. Fall and spring. Noblit.

EDUC 876 [376] PROBLEMS IN THE HISTORY OF EDUCATION (3 or more). Prerequisite, EDUC 774 or equivalent. Provides an opportunity for advanced doctoral students to do independent study under supervision. As demand warrants. Unks.

EDUC 877 [377] CRITICAL MULTICULTURAL EDUCATION (3). Examination of the current issues in multicultural education, cultural study and the development of curriculum for critical multicultural education. Fall. Hanley.

EDUC 878 [378] SEMINAR IN EDUCATIONAL STUDIES (3). Involves an in-depth exploration of theories and issues involving culture, curriculum and change. Topics will vary. As demand warrants. Staff.

EDUC 881 [381] SEMINAR IN HUMAN DEVELOPMENT AND INDIVIDUAL DIFFERENCES (3). Prerequisite, at least one course in human development at the graduate level, or permission of the instructor. Analyzes research data and theoretical positions pertaining to individual differences in human development in the educational setting. Spring of even-numbered years. Meece.

EDUC 882 [382] SEMINAR IN HUMAN LEARNING AND COGNITION (3). Prerequisite, one or two courses in educational and developmental psychology. Studies theoretical aspects and practical implications of psychologies of learning. Fall or spring of odd-numbered years. Staff.

EDUC 883 [383] CASE STUDY METHODS (3).

EDUC 884 [384] STATISTICAL ANALYSIS OF EDUCATIONAL DATA III (3). Prerequisites, EDUC 684, 784. An extension of the general linear model to analysis of educational data with multiple dependent variables, with computer applications. Fall, summer. Ware.

EDUC 885 [385] SECONDARY DATA ANALYSIS (3).

EDUC 888 [388] INTRODUCTION TO STRUCTURAL MODELING (3).

EDUC 981 [275] FIELD TECHNIQUES IN EDUCATIONAL RESEARCH (3). Prerequisite, EDUC 684. Introduces students to field research methods and analysis of qualitative data that focuses on the application of these techniques in evaluation and policy research. Fall and spring. Marshall, Noblit, Eaker-Rich.

EDUC 982 [371] ADVANCED QUALITATIVE ANALYSIS AND INTERPRETATION (3). This advanced seminar focuses on the needs of doctoral students immersed in qualitative research, with an emphasis on data analysis and representation. Fall. Noblit.

EDUC 990 [307] SUPERVISED RESEARCH (1). Provides students with the opportunity to work with individual faculty members in collaborative research activities in association with a seminar during the second, third and fourth semesters of study. May be repeated. Open to graduate students only. Fall and spring. Staff.

EDUC 992 [392] MASTER'S PROJECT (3). Focuses on the development of a master's project or a major paper other than a thesis.

EDUC 993 [393] MASTER'S THESIS (3).

EDUC 994 [394] DOCTORAL DISSERTATION (3).

Department of English and Comparative Literature

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BEVERLY TAYLOR, *Chair*

English Program

Professors

William L. Andrews (101) African American, American
Christopher M. Armitage (1) Renaissance, Poetry
David Baker, Shakespeare
A. Reid Barbour (83) Renaissance, Renaissance Studies
James W. Coleman (89) American, African American, 20th-Century American, Southern
Pam Durban (114) Creative Writing
Connie C. Eble (9) English Language, Medieval
Darryl J. Gless (62) Renaissance
Philip Gura (78) American, American Studies
Minrose Gwin (123) Southern, 20th-Century American
Trudier Harris (60) 20th-Century American, African American, American, Southern, Novel, Poetry
Mae Henderson (102) African American, 20th-Century American, Critical Theory
Fred Hobson (84) American, Southern, 20th-Century American, American Studies
Joy Kasson (90) American, American Studies
Edward Donald Kennedy (22) Medieval, Medieval Studies, Comparative Literature, Medieval Drama
Laurie Langbauer (97) 19th-Century British, Critical Theory
George S. Lensing Jr. (26) 20th-Century American and British, Poetry
Michael A. McFee (99) Creative Writing
John P. McGowan (92) Critical Theory, 19th-Century British, Comparative Literature, Cultural Studies, Novel, Women's Studies
Jeanne Moskal (77) 19th-Century British, Critical Theory, Women's Studies
Patrick P. O'Neill (66) Medieval, English Language, Celtic, Medieval Studies
Ruth Salvaggio (124) 18th Century, Critical Theory
James Seay (87) Creative Writing
Alan R. Shapiro (96) 20th-Century American, Creative Writing
Beverly W. Taylor (70) 19th-Century British, Novel, Women's Studies
James P. Thompson (72) 18th-Century British, Critical Theory, Novel
Joseph S. Viscomi (76) 19th-Century British
Linda Wagner-Martin (80) American, 20th-Century American, Southern, Comparative Literature, Novel, Poetry, Women's Studies
Joseph S. Wittig (51) Medieval, English Language

Associate Professors

Nicholas Allen (117) Irish Literature, 20th-Century British
Daniel R. Anderson (104) Rhetoric, Composition and Literacy
Erin Carlston (108) 20th-Century American and British, Comparative Literature, Cultural Studies, Women's Studies
Pamela Cooper (88) 20th-Century British, Cultural Studies, Novel, Women's Studies
Tyler Curtain (109) Critical Theory, Cultural Studies, Novel
Jane M. Danielewicz (98) English Language, Rhetoric, Composition and Literacy
María DeGuzmán (110) Latino/Latina Studies, 20th-Century American, Critical Theory
Mary Floyd-Wilson (116) Renaissance
Marianne Gingher (111) Creative Writing
Randall Kenan (119) Creative Writing
Ritchie D. Kendall (64) Renaissance, Drama, Renaissance Studies
Theodore H. Leinbaugh (65) Medieval, Medieval Studies, Comparative Literature
Allan R. Life (55) 19th-Century British
Megan Matchinske (94) Renaissance, Cultural Studies, Renaissance Studies, Women's Studies
Thomas Reinert (103) 18th-Century British, Novel, Poetry
Eliza Richards (120) American
Bland Simpson (100) Creative Writing
Todd W. Taylor (105) Rhetoric, Composition and Literacy
Jane Thrailkill (112) American, 20th-Century American
Jessica Wolfe (106) Renaissance

Assistant Professors

Gregory Flaxman (118) Film Studies, 20th-Century British
Jennifer Ho (121) Contemporary Literature, Asian American Literature, American Studies
Jordynn Jack (122) Rhetoric and Composition

Rebecka Rutledge Fisher, African American Literature, Caribbean Literature, Theory and Criticism, Cultural Studies, American Studies, Metaphor, Post-Structuralism, Black Nationalism

Professors Emeriti

Laurence G. Avery
Doris W. Betts
Allen Dessen
Joseph Flora
Johnny Lee Greene
William Harmon
Howard M. Harper Jr.
J. Kimball King
Erika C. Lindemann
C. Townsend Ludington Jr.
Margaret A. O'Connor
Daniel W. Patterson
Julius R. Raper III
Richard D. Rust
Thomas A. Stumpf
Weldon E. Thornton
David Whisnant
Charles G. Zug III

Comparative Literature Program

Professors

Dino Cervigni (44) Medieval and Renaissance Italian Literature
Marsha S. Collins (42) Modern Peninsular Literature, Golden Age Spanish Literature
Eric S. Downing (4) 18th- and 19th-Century Literature, Literary Theory, Classics
Edward Donald Kennedy (3) Medieval, Medieval Studies, Comparative Literature, Medieval Drama
Clayton Koelb (4) Modern Literature, Literary Theory, Philosophy and Aesthetics, Comparative Literature
John P. McGowan (92) Critical Theory, Cultural Studies, Novel, Women's Studies
James L. Peacock (11) Anthropology, Symbolic Systems

Associate Professors

Diane R. Leonard (2) Modern Narrative, Modern Criticism and Theory
José Manuel Polo de Bernabé (34) 19th- and 20th-Century Spanish Drama and Poetry, Modern Critical Theory and Film
Alicia Rivero (38) Contemporary Spanish American Literature, Modern Critical Theory, Gender Issues, Literature and Science, Intellectual History

Assistant Professor

Inger S. B. Brodey (5) Prose Fiction in Late 18th- and Early 19th- Century Europe and Meiji Japan

Adjunct Professors

E. Jane Burns (1) Medieval French Literature, Feminist Theory
David J. Halperin (14) Judaism in Antiquity; Jewish Mysticism; Comparative Study of Judaism, Christianity and Islam
Madeline G. Levine (4) Russian and Polish Literature, Translation Theory
Jessica Wolfe (106) Renaissance

Lecturer

John A. (Tony) Day, Southeast Asian Literature and History

Professors Emeriti

Paul Debreczeny
Lilian R. Furst
S. K. Heninger Jr.
George A. Kennedy
G. Mallary Masters
Richard A. Smyth
Philip A. Stadter

The Department of English and Comparative Literature offers an M.A. and Ph.D. in comparative literature and an M.A. and Ph.D. in English. Each program is described in detail below.

The English program offers work leading to the doctor of philosophy degree. The M.A. degree, earned in the first two years of graduate study, aims at mastery of scholarly techniques and broad knowledge of British and American literature. Building on the M.A., the Ph.D. is a more specialized degree, with a major in one of the following areas of specialization:

- The English language
- English literature from its beginnings to 1485
- English literature from 1485 to 1660 (including Milton)
- English literature from 1660 to 1789
- English literature from 1789 to 1900
- American literature to 1900
- American literature from 1900 to the present
- British literature from 1900 to the present
- Critical theory and cultural studies
- Rhetoric, composition and literacy
- African American literature
- Southern literature

Ph.D. students also focus on a minor, chosen from one of these fields just listed, or from a genre (drama, novel, poetry) or the English language or from the following alternative minors: American studies, Celtic, comparative literature, cultural studies, Latina/Latino literature, medieval studies, Renaissance studies, and women's studies. Alternatively, students may develop their own minor within the department or take an appropriate minor outside the department, with the approval of the director of graduate studies.

Candidates for the M.A. in English must complete nine courses, demonstrate a reading knowledge of a foreign language, write a thesis (ENGL 993) or fulfill a thesis option (ENGL 992), and pass an oral defense of their thesis or thesis option. The courses elected by an M.A. student must include one course in the English language, chosen from among the following: ENGL 719 (Old English); ENGL 814 (History of the English Language); ENGL 613 (Modern English Language); ENGL 720 (Old English Literature: Beowulf, prerequisite ENGL 719); or, with permission of the director of graduate studies, a graduate course in linguistics, theory of language or philosophy of language. M.A. candidates must also take Rhetorical Theory and Practice (ENGL 606); two ProSeminar courses that introduce the student to professional work in designated periods; two courses that satisfy distribution requirements and three additional courses in areas of interest. A student must also complete three additional credit hours in any course offered within the department or in any of the fields described as alternative minors. If a minor outside the department (normally nine semester hours) is chosen, the program must be adjusted and the adjustment approved by the student's advisor and the director of graduate studies. Students must also satisfy residence credit requirements set by The Graduate School. Most students take one and a half years to complete the M.A. degree. With permission of the director of graduate studies, a regularly admitted graduate student whose native language is not English may follow a special program of studies leading to a terminal master's degree with a concentration in American literature.

Graduate School requirements for the doctor of philosophy degree in English are set forth under the heading "Graduate Degrees and Degree Requirements." A Ph.D. student must fulfill the following course requirements: ENGL 606; two seminars in the major; one seminar in the minor, and one additional seminar. In addition to course work, a candidate for the Ph.D. must pass two examinations administered by the department for which they prepare by working closely with a faculty committee a year in advance: a written examination in the major and minor, and an oral examination in the major and minor and on the dissertation subject area. Doctoral candidates must also demonstrate a reading knowledge of two foreign languages (one of which fulfilled a requirement for the M.A.). The program culminates with the candidate writing a dissertation (and registering for at least three semester hours of ENGL 994) and successfully defending it in an oral examination. Students must also satisfy residence credit requirements set by The Graduate School. The department strongly recommends that candidates for the Ph.D. have supervised classroom teaching experience before receiving the degree. Such experience, when it can be offered, is considered as fulfilling a requirement for the degree. Students generally take four years beyond the M.A. to complete the degree.

The graduate program in comparative literature stresses, from an international perspective, the exploration of styles, themes, genres, movements, literary theory and literary criticism. Students take many of their courses in the cooperating literature departments and may choose among the rich offerings in the literatures of England, France, Germany, Ancient Greece and Rome, Italy, Portugal, Spain, Latin America, Russia, Asia and the United States. Students in the Ph.D. program take courses in three national literatures.

Requirements for the M.A. include CMPL 700, two courses in the history of criticism covering together the period from the Greeks to the 20th century, at least one course in literary theory and at least six courses in literature—ordinarily two in each of two national literatures and two from offerings in the program, and successful completion of an oral examination and a thesis. One theory or criticism course may be postponed until the student enters the Ph.D. program and another Comparative Literature course substituted for it.

Requirements for the Ph.D. program include the requirements for the M.A. or their equivalent taken at UNC-Chapel Hill or elsewhere; seven courses (counting those taken for the M.A.) in one national literature chosen to provide study of its historical development; five courses (counting those taken for the M.A.) in a second and third national literature (ordinarily distributed 3/2) and 10 courses (counting those taken for the M.A.) from offerings in the program. At least two of the courses should be seminars. Doctoral students are expected to develop one major and one minor track of special interest in some aspect of comparative studies through course work and independent reading. The Ph.D. written examination is devoted to these special interests. Among tracks currently available are medieval studies, Renaissance studies, feminist studies, folklore, history of criticism, literary theory, narrative studies, rhetoric, romanticism, realism and naturalism, but students may request the approval of other tracks. The Ph.D. oral examination is devoted to discussion of the prospectus for a dissertation.

Admissions Requirements

Application for admission must be made on forms provided by The Graduate School or by The Graduate School's electronic application process. These also serve as applications for fellowships and assistantships if the applicant marks the appropriate statement on the form.

Applicants for advanced degrees must have completed an undergraduate degree, customarily with a major in English, literature or related field, at the time of enrollment. To be reviewed for admission by the department's Graduate Advisory Committee, applications must be supported by Graduate Record Examination (GRE) scores, at least three letters of recommendation, and official transcripts showing courses, grades and degrees awarded. A writing sample and a personal statement should also be submitted. Only applicants with an M.A. in English are eligible for admission directly into the Ph.D. English program. Students who complete an M.A. in the Department of English and Comparative Literature and wish to proceed into the Ph.D. program are reviewed by the Graduate Advisory Committee for possible permission to do so. More information about the department can be obtained via its Web site at www.english.unc.edu.

Fellowships and Assistantships

Financial support for graduate students is described in the Admissions and Financial Information chapter. All applicants to the Department of English and Comparative Literature are eligible to compete for University fellowships and assistantships. In addition, the department awards two types of assistantships—research assistantships and teaching fellowships. Neither is usually available in the summer. Research assistants are assigned to faculty members to help with research projects. Teaching fellows have full instructional responsibility for sections of beginning composition courses. Graduate students in the third year of the Ph.D. program who also have taught at least four sections of composition become eligible for teaching literature courses. Only persons beyond their first year of study in the M.A. program are eligible for teaching fellowships. Non-native speakers are not considered for teaching fellowships until they have been enrolled in the Ph.D. program for at least a year. The stipend for a teaching fellow is $7,350 per section, the initial assignment usually being one section a semester. A full teaching load is typically three courses per academic year. Teaching fellows are trained and supervised by the directors of composition and undergraduate studies and are subject to student and faculty evaluation.

Foreign Language Proficiency

The Department of English and Comparative Literature considers a reading knowledge of foreign languages essential to the educational and professional aims of its degree programs. M.A. candidates must show proficiency in one foreign language and Ph.D. candidates in two languages. The department recommends Latin, French, German, Italian or Spanish. The use of other languages to fulfill the requirement must be approved by the director of graduate studies. An undergraduate major in an approved language automatically satisfies the requirement. Ordinarily, however, students fulfill the requirements by passing an examination administered through the University; by completing reading courses for graduate students offered by the Classics, German and Romance Languages departments; or, while enrolled as graduate students, by completing with a grade of at least B an undergraduate literature course in a foreign language. The foreign language requirement for the M.A. must be satisfied before the student can be admitted to candidacy for the Ph.D.

Library and Research Facilities

The library system at the University of North Carolina at Chapel Hill is ranked among the top 20 research libraries in the United States. It has excellent holdings for the study of English philology and British

and American literature, including the Southern Historical Collection (containing manuscripts, letters and diaries) and the Hanes Collection of Incunabula. Through cooperative arrangements, university libraries in the Triangle area are open to graduate students from the University of North Carolina at Chapel Hill.

Publications

Early American Literature, *Studies in Philology*, *The Southern Literary Journal*, *a/b: Auto/Biography Studies* and *The Keats-Shelley Journal* are edited by English Department faculty members and have their editorial offices in the English Department building.

Doctor of Philosophy Degree with a Minor in Renaissance Studies

Students working on their doctorate in one of the regular departmental programs may, with the approval of their departmental director of graduate studies, submit for the degree an interdisciplinary minor in Renaissance studies. The program is based in the Comparative Literature program and administered by the Arts and Sciences Committee for Renaissance Studies. The minor requires a minimum of five courses. Of those five, one must be CMPL 892, Seminar in Renaissance Studies. The remaining four courses must represent equally two fields other than the major field (e.g., a student with a major in Italian could offer from the approved list two courses in French, two in Latin and CMPL 892).

CMPL 892, Seminar in Renaissance Studies, serves as a nucleus for the minor, affording students the opportunity to bring together seemingly divergent strains in an interdisciplinary context. Normally the faculty member giving the course invites other members of the Renaissance faculty to participate in the discussions and to present related materials from their own field of inquiry. Student participants choose a related topic or area for research and all report regularly on their own projects under investigation. The course is cross-listed as appropriate, under departmental offerings.

The minor in Renaissance studies for the Ph.D. is examined orally at the departmental oral examination (not the defense), unless written examination is required by departmental policy; normally faculty with whom the candidate has taken courses serve as examiners.

A working knowledge of Latin is strongly recommended for students in the program.

Master of Arts Degree with a Minor in Renaissance Studies

Students working on their M.A. in one of the regular departmental programs may also, with the approval of their departmental director of graduate studies, submit for the degree an interdisciplinary minor in Renaissance studies. The program, like that for the Ph.D., is in the Comparative Literature program and is administered by the Arts and Sciences Committee for Renaissance Studies. The minor requires a minimum of three courses. The three courses must be from the offerings of two fields other than the major field. The minor in Renaissance studies at the M.A. level should encourage students to broaden their program early and should prepare them for continued interdisciplinary work at the doctoral level. It is not designed for terminal M.A. students.

Faculty in Renaissance Studies and Related Areas

Art History: Mary Pardo, Jaroslav Folda
English: Christopher Armitage, David Baker, Reid Barbour, Mary Floyd-Wilson, Ritchie Kendall, Darryl Gless, Megan Matchinske, Jessica Wolfe
History: Melissa M. Bullard, Barbara Harris, Michael McVaugh, Jay Smith
Music: John Nádas, Thomas Warburton
Religious Studies: Peter Kaufman
Romance Languages: Lucia Binotti, Dino Cervigni, Marsha Collins, Frank Dominguez, Carmen Hsu, Hassan Melehy, Ennio I. Rao, Frederick Vogler

English

Courses for Graduates and Advanced Undergraduates

487 [186] FOLK NARRATIVE (FOLK 487) (3). The study of three genres of folk narrative—fairytale, personal narrative and legend—and their distinctive roles in contemporary life.

489 CULTURAL STUDIES—CONTEMPORARY ISSUES (3). The student will have an opportunity to concentrate on topics and texts central to the study of culture and theory.

525 SENIOR SEMINAR IN RENAISSANCE LITERATURE (3). Senior-level survey of one or two key themes or issues in the literature of the English Renaissance.

564 INTERDISCIPLINARY APPROACHES TO LITERATURE (3). Examines the ways knowledge from other disciplines can be brought to bear in the analysis of literary works. Questions of disciplinary limits and histories will also be addressed.

566 LITERATURE AND PSYCHOANALYSIS (3). This course offers an introduction to the theoretical intersection of psychoanalysis and literature and to the spectrum of what is called "psychoanalytic theory."

578 IRISH AMERICAS, AMERICAN IRELANDS (3). Course will explore the cultural connections between Ireland and America in literature and film to examine how each has imagined the other.

580 FILM—CONTEMPORARY ISSUES (3). This course is designed to introduce students to a particular historical or cultural aspect of the cinema.

581 [047] CONTEMPORARY APPROACHES TO FICTION (3). Examines the formal features of narrative and its role in shaping social values, groups and identities through readings in literary theory, short stories and novels.

582 [048] CONTEMPORARY APPROACHES TO POETRY (3). The course is an introduction to the genre of poetry and its subgenres, to the practice of reading it in both form and content, and to the work of selected poets or individual poets.

583 [046A] DRAMA ON LOCATION (3). Offered as part of summer study abroad programs in Oxford, London, and Stratford-on-Avon. Students experience plays in performance and as texts, and discuss their literary, dramatic, cultural and historical aspects.

585 [147] BRITISH AND AMERICAN FOLKSONG (FOLK 585) (3). Explores the forms, functions and relationships of British and American folksongs, charting the emergence of Anglo- and African American vernacular musics and the dynamic processes of tradition, creolization, innovation and revival.

587 [187] FOLKLORE IN THE SOUTH (FOLK 587) (3). An issue-oriented study of Southern folklore, exploring the ways that vernacular artistic expression (from barns and barbecue to gospel and well-told tales) come to define both community and region.

589 [189] AFRICAN AMERICAN FOLKLORE (FOLK 589) (3). Focuses on the richness and variety of oral traditions that define African American culture, with some emphasis on African origins.

600 [130] ADVANCED EXPOSITORY WRITING (3). The course, restricted to graduate students in English, offers students practice writing vitae and job application letters, grant or conference proposals, dissertation or thesis chapters, book reviews or journal articles.

601 ACADEMIC WRITING FOR INTERNATIONAL STUDENTS (3). Designed to help international graduate students improve skills in academic writing. attention to organization, flow and presentation of an academic paper. Fall and spring.

603 ORAL COMMUNICATION FOR INTERNATIONAL STUDENTS (1-3). Designed to help international graduate students refine oral communication skills in academic contexts. Attention to pronunciation, participating in group discussions and making presentations.

605 [132] HISTORY OF RHETORIC AND COMPOSITION (3). A survey of major figures in the history of rhetoric, beginning with classical rhetoric, but emphasizing contemporary rhetorical theory.

606 [131] RHETORICAL THEORY AND PRACTICE (3). A study of rhetorical theories and practices from classical to modern times. Emphasis is on translation of theories into instructional practice for teaching in the college writing classroom.

613 [136] MODERN ENGLISH GRAMMAR (LING 613) (3). A study of current English structure and usage using a traditional approach modified by appropriate contributions from structural and generative grammar, with some attention to the application of linguistics to literary analysis.

619 [151] SURVEY OF OLD AND MIDDLE ENGLISH LITERATURE (3). An introduction to English literature from the eighth to the 15th century, focusing on the primary works of Old English and Middle English literature.

621 [153] ARTHURIAN ROMANCE (CMPL 621) (3). British and continental Arthurian literature in translation from the early Middle Ages to Sir Thomas Malory.

625 [258] SHAKESPEARE (3). A study of selected plays and poetry by Shakespeare and some of the key critical and theoretical approaches to his work.

626 [255] RENAISSANCE DRAMA (3). A study of a representative group of plays by dramatists writing between the establishment of the permanent theaters in the 1570s and the closing of those theaters in 1642.

627 [254] LITERATURE OF THE EARLIER RENAISSANCE (3). A graduate-level survey of the literature of the earlier Renaissance in England.

628 [260] LITERATURE OF THE LATER RENAISSANCE (3). In this course, students will interrogate the social, historical and representational dimensions of 17th-century literature and culture in England.

629 [264] MILTON (3). A study of Milton's prose and poetry in the extraordinary context of 17th-century philosophy, politics, religion, science and poetics, and against the backdrop of the English Civil War.

630 [358] SHAKESPEARE AND HIS CONTEMPORARIES (3). This course will examine drama written and performed in England from 1570 to 1640, situating Shakespeare's plays in relation to others in his generation.

631 [166] 18TH-CENTURY LITERATURE (3). Studies in a variety of British writers from Rochester to Cowper.

637 [172] CHIEF BRITISH ROMANTIC WRITERS (3). A survey of the major British Romantic writers, including Blake, Wordsworth, Coleridge, Byron, Percy and Mary Shelley, and Keats, with an introduction to the chief scholarly and critical problems of this period.

639 [174] VICTORIAN LITERATURE (3). Survey of major Victorian writers such as Tennyson, the Brownings, Arnold, Dickens, the Brontes, G. Eliot, Mill, Ruskin.

643 INTRODUCTION TO AMERICAN LITERATURE TO 1860 (3). A graduate-level survey of American literature from the European settlement of the New World through 1860. Consideration of authors in their aesthetic, historical, and contemporary critical contexts.

644 INTRODUCTION TO AMERICAN LITERATURE, 1860–1900 (3). A graduate-level introduction to the range of American writing from the Civil War through 1900. Attention given to major critical concerns, e.g., the cultural force of realism, etc.

651 [195] BRITISH AND AMERICAN DRAMA OF THE 20TH CENTURY (3). A survey of British and American drama, poetry, fiction and criticism.

657 [190] ENGLISH AND AMERICAN LITERATURE OF THE 20TH CENTURY (3). A survey of 20th-century English and American drama, poetry, fiction and criticism.

659 [196] WAR IN 20TH-CENTURY LITERATURE (PWAD 659) (3). A study of literary works written in English concerning World War I, or the Spanish Civil War and World War II, or the Vietnam War.

660 [196D] WAR IN SHAKESPEARE'S PLAYS (PWAD 660) (3). The focus is on Shakespeare's various treatments of war in his plays: all his Roman histories, most of his English histories, all his tragedies, even some of his comedies.

661 [140] INTRODUCTION TO LITERARY THEORY (3). Examines contemporary theoretical issues and critical approaches relevant to the study of literature.

662 [240] HISTORY OF LITERARY CRITICISM (3). A history of literary criticism from the Greeks to mid-20th century, focusing on recurrent concerns and classic texts that are indispensable for understanding the practice of literary criticism today.

663 POSTCOLONIAL THEORY (3). This course covers major works of and topics in postcolonial theory.

664 [190Q] THE CHALLENGE OF QUEER THEORY TO LITERARY STUDIES, CULTURAL STUDIES, AND THE HUMANITIES (3). An advanced-level investigation of queer theory's challenges to literary criticism, cultural studies and questions of critical methodology in the humanities. Cutting-edge research and just-published articles will be used.

665 [155] QUEER LATINA/O LITERATURE, PERFORMANCE AND VISUAL ART (WMST 665) (3). This course explores literature, performance art, film and photography by Latinas and Latinos whose works may be described as "queer" and that question terms and norms of cultural dominance.

666 [180] QUEER LATINA/O PHOTOGRAPHY AND LITERATURE (WMST 666) (3). This course explores Latina/o literature about photography in relation to photography by "queer" Latina/o artists and, through this double focus, poses certain questions about identity, subjectivity and culture.

673 [188] LITERATURE OF THE U.S. SOUTH (3). A study of the literature of the United States South, in most cases focusing on 20th-century Southern literature and on prose fiction.

680 FILM THEORY (3). This course offers a rigorous introduction to the various theories (aesthetic, narratological, historiographic, ideological, feminist, poststructuralist) inspired by the cinema.

684 WOMEN IN FOLKLORE AND LITERATURE (FOLK 684, WMST 684) (3). An exploration of representations of women in oral traditions as well as in literature based on oral traditions.

685 [179] LITERATURE OF THE AMERICAS (AMST 685, CMPL 685) (3). Prerequisite, two years of college-level Spanish or the equivalent. Multidisciplinary examination of texts and other media of the Americas, in English and Spanish, from a variety of genres.

686 READINGS IN LITERATURE AND ENVIRONMENT (3). Readings course selects an author, genre or method as a means of deepening awareness of the politics, poetics and paradoxes in the field of literature and environment.

687 [191] CANADIAN LITERATURE IN ENGLISH (3). A study of Canadian literature in English, with emphasis on writing since 1940, particularly the novels by, for example, Margaret Laurence, Robertson Davies, Mordecai Richler and Margaret Atwood.

Courses for Graduates

701 [201] INTRODUCTION TO MEDIEVAL STUDIES (3). Introduction to medieval studies for graduate students in any department. Intended to expose students to research problems, tools and techniques in fields other than their own.

719 [237A] OLD ENGLISH GRAMMAR AND READINGS (3). An introduction to Old English language and literature that also attempts to relate that language to Modern English and to the larger context of the history of the English language.

720 [250] OLD ENGLISH POETRY (3). The translation and interpretation of Old English poetry including works such as The Wanderer, The Seafarer, Deor, The Dream of the Rood, and Beowulf. Course prerequisite, a working knowledge of Old English.

721 [251] EARLY MIDDLE ENGLISH LITERATURE (3). An introduction to Early Middle English, its varieties and genres from c. 1150 (The Peterborough Chronicle) to c. 1330 (the Harley lyrics).

722 MIDDLE ENGLISH ALLITERATIVE POETRY (3). Prerequisite, a working knowledge of Middle English. An exploration of the Middle English poetry of the 14th-century alliterative "Revival," including the works of the Gawain/Pearl poet of the Langland.

723 LATER MIDDLE ENGLISH LITERATURE (3). English literature of the late 14th and 15th centuries, including Gower, the English and Scottish Chaucerians and Sir Thomas Malory.

724 [252] CHAUCER (3). A study of Chaucer's major poetry, including Troilus and Criseyde, at least some of the "dream" poems such as Parliament of Fowls, and most of The Canterbury Tales.

747 [283] STUDIES IN THE AMERICAN NOVEL (3). A wide-ranging, graduate-level survey of the American novel from the late 18th century through the 20th century.

748 STUDIES IN AMERICAN POETRY (3). A wide-ranging, graduate-level survey of American poetry from the late 18th century through the 20th century.

762 [241] SPECIAL TOPICS IN CULTURAL STUDIES (3). An introduction to myriad texts, topics, controversies, institutions and personalities that make up the ongoing knowledge projects that are loosely affiliated under the rubric "cultural studies."

776 OLD IRISH I (3). The main emphasis of the course will be on mastering the basic grammar of the language. There will be some readings from selected Old Irish glosses and from "Aislinge Oenguso."

777 OLD IRISH II (3). Prerequisite, ENGL 776. Readings from a variety of genres of Old Irish literature: Stories from the Tain, Crith Gablach, Cambrai Homily, Early Irish Lyrics, Scela Mucce Meic Datho.

778 MEDIEVAL WELSH I (3). An introduction to Medieval Welsh language and literature.

779 MEDIEVAL WELSH II (3). Prerequisite, ENGL 778. Readings in Old and Middle Welsh Literature.

780 [211] PROSEMINAR IN BRITISH LITERATURE, 800–1500 (3).

781 [212] PROSEMINAR IN BRITISH LITERATURE, 1500–1660 (3).

782 [213] PROSEMINAR IN BRITISH LITERATURE, 1660–1770 (3).

783 [214] PROSEMINAR IN BRITISH LITERATURE, 1770–1870 (3).

784 [215] PROSEMINAR IN AMERICAN LITERATURE, PRIOR TO THE CIVIL WAR (3).

785 [216] PROSEMINAR IN LITERATURE AFTER 1870 (3).

800 [231] TECHNOLOGY AND THE HUMANITIES (3). Course explores the impacts of information technology on teaching and scholarship in the humanities. Students critique and learn to integrate emerging technologies into their pedagogy and research interests.

801 [299] RESEARCH METHODS IN COMPOSITION AND RHETORIC. Course introduces graduate students to methodologies of research in the field of rhetoric and composition. Emphasis is on theoretical and practical concerns that improve teaching and help develop research agendas.

805 [300] STUDIES IN RHETORIC AND COMPOSITION (1–4). Focus varies by semester, but generally investigates intersections of literacy, pedagogy and rhetorical theory. Courses range from explorations of technology and literacy, to investigations of forms of writing and pedagogy.

814 [238] HISTORY OF THE ENGLISH LANGUAGE (LING 814) (3). Study of English from its Proto-Indo-European origins through the 18th century focusing on historic events and the major changes to the structure and usage of English they occasioned.

819 [350] SEMINAR IN OLD ENGLISH LANGUAGE AND LITERATURE (3). Topics in Old English poetry and prose that vary with each seminar and instructor.

821 [351] SEMINAR IN MIDDLE ENGLISH LITERATURE (3). Intensive study of major Middle English authors or genres or of medieval cultural influences. Topics have included Malory, Piers Plowman and its tradition, drama and intellectual backgrounds of medieval literature.

824 SEMINAR IN CHAUCER (3). Advanced graduate seminar on Chaucer.

825 RENAISSANCE LITERATURE IN CONTEXT (3). A study of select works of Renaissance literature, both dramatic and nondramatic, in its intellectual, social, political or religious context.

826 STUDIES IN RENAISSANCE GENRES (3). This course traces the historical trajectory of renaissance literary genres. Each offering focuses on a generic kind or set of kinds. (Topics may include pastoral, epic, satire, etc.)

827 STUDIES IN RENAISSANCE AUTHORS (3). Concentrated studies of single authors, groups of authors thematically linked, or authors in their families or coteries.

828 PERSPECTIVES ON RENAISSANCE LITERATURE AND CULTURE (3). Students will study Renaissance literature while assessing the usefulness and status of a theoretical approach, such as feminist theory, queer theory, cultural materialism, new historicism or psychoanalytic theory.

829 [261] STUDIES IN RENAISSANCE LITERATURE: DRAMA (3). A study of Renaissance drama linked thematically, or framed by select cultural practices and historical issues.

830 [354] STUDIES IN RENAISSANCE LITERATURE: PRIMARILY NONDRAMATIC (3). A focused examination of an aesthetic, historical or theoretical problem in the study of Renaissance literature.

831 [366] SEMINAR IN 18TH-CENTURY LITERATURE (3). Selected topics in 18th-century Literature.

832 [265] RESTORATION AND 18TH-CENTURY DRAMA (3). Studies in Restoration and 18th-century drama from Etherege to Sheridan.

833 [266] STUDIES IN ENGLISH LITERATURE, 1660–1740 (3). Studies in Restoration and Augustan writers from Dryden to Haywood.

834 [267] LATER 18TH-CENTURY WRITERS (3). Studies in later 18th-century writers from Gray to Wollstonecraft.

835 [343] 18TH-CENTURY FICTION (3). Studies in 18th-century fiction from Behn to Austen.

836 STUDIES IN 18TH-CENTURY WOMEN WRITERS. Behn, Haywood, Manley, Montague, Burney, Wollstonecraft and Austen.

837 [272] STUDIES IN ENGLISH LITERATURE, 1780–1832 (3). Sections: 1) Blake, Wordsworth, Coleridge, 2) Byron, Shelley, Keats. Examination of the major Romantic poets, supplemented by readings in other Romantic authors.

838 [244] 19TH-CENTURY BRITISH NOVEL (3). Examination of important 19th-century British novels, such as those by Austen, Scott, Dickens, the

Brontes, sensation novelists, Gaskell, Carroll, Thackeray, Eliot, Trollope, Doyle, Hardy, Meredith.

839 [273] VICTORIAN NONFICTIONAL PROSE (3). Examination of Victorian critics, travel writers, feminists, scientists and historians in relation to the controversies of the period.

840 [274] STUDIES IN VICTORIAN LITERATURE: POETRY (3). Study of Victorian poets, focused on a group or a topic, including figures such as Tennyson, the Brownings, Arnold and the Pre-Raphaelites.

841 [372] SEMINAR IN 19TH-CENTURY ROMANTICISM IN ENGLAND (3). Topics concerning major authors and issues of the Romantic period.

842 [373] SEMINAR IN VICTORIAN LITERATURE (3). Topics concerning major authors and issues of the Victorian period.

843 [381] SEMINAR IN AMERICAN LITERATURE TO 1860 (3). Topics vary: e.g., New England Puritanism, New England response to American literary nationalism; Emerson; Irving, Hawthorne and Poe and the development of the American short story.

844 [382] SEMINAR IN AMERICAN LITERATURE, 1860–1900 (3). In-depth exploration for doctoral students of selected topics or authors in American literature from 1860 to 1900.

847 [383] SEMINAR IN THE AMERICAN NOVEL (3). Doctoral-level seminar in the selected topics or authors.

848 SEMINAR IN AMERICAN POETRY (3). Selected topics of authors.

850 [292] STUDIES IN ENGLISH AND AMERICAN POETRY OF THE TWENTIETH CENTURY (3). Usually taught as a survey of major poets: Yeats, Frost, Stevens, Williams, Pound, Eliot, Auden, with some more recent poets.

851 [295] STUDIES IN ENGLISH AND AMERICAN DRAMA OF THE 20TH CENTURY (3). Usually taught as a survey of major playwrights of the modern era, from the continental influences (Ibsen and Strindberg) to such contemporary figures as Pinter and Stoppard.

852 [395] SEMINAR IN MODERN DRAMA (3).

857 [290] STUDIES IN 20TH-CENTURY ENGLISH AND AMERICAN LITERATURE (3). Studies in special modern and/or contemporary topics; e.g., the Irish literary renaissance, Latina/o studies, Asian American studies, cultural, visual culture, postcolonial, gender and/or ethnic studies and British and/or American literature.

858 [293] STUDIES IN ENGLISH AND AMERICAN FICTION OF THE 20TH CENTURY (3). Usually taught as a survey of major writers: Joyce, Lawrence, Woolf, Hemingway, Faulkner, with some other writers.

860 [390] SEMINAR IN 20TH-CENTURY LITERATURE, ENGLISH AND AMERICAN (3).

861 [391] SEMINAR IN LITERARY AND CULTURAL THEORY (3). Seminar with varying topics, focusing on recent developments in literary and cultural theory, including narratology, feminism, psychoanalysis and postcolonial and materialist theory.

862 [341] SEMINAR IN CULTURAL STUDIES (3). Advanced exploration of myriad tests, topics, controversies, institutions and personalities that make up the ongoing knowledge projects that are loosely affiliated under the rubric "cultural studies."

863 [390C] SEMINAR IN POSTCOLONIAL LITERATURE (3). Course examines the shifting meanings of postcoloniality in 20th- and 21st- century literature from formerly colonized countries.

864 [286] STUDIES IN LATINA/O LITERATURE, CULTURE AND CRITICISM. Representative work by Latina/o writers and critics in relation to major social and historical trends and critical models-border theory, biculturalism, mestizaje, tropicalization, diaspora, pan-latinidad, Afro-Latina/o disidentifications and LatinAsia studies.

867 [284] AFRICAN AMERICAN AND AFRICAN DIASPORAN LITERATURE TO 1930 (3). Representative writers and literary and cultural traditions from the beginning of African American literature to 1930.

868 AFRICAN AMERICAN AND AFRICAN DIASPORAN LITERATURE, 1930–1970 (3). Key writers within the context of selected literary, cultural and critical traditions from 1930 to 1970.

869 AFRICAN AMERICAN AND AFRICAN DIASPORAN LITERATURE, 1970 TO THE PRESENT (3). Representative writers and literary, cultural and critical traditions from 1970 to the present.

871 [384] SEMINAR IN AFRICAN AMERICAN LITERATURE (3). An intensive study of a major writer or text, a group of writers or texts, or an important trend, tradition or literary period.

872 STUDIES IN AFRICAN AMERICAN AND AFRICAN DIASPORAN LITERATURE (3). An intensive study of a particular aspect of African American literature, such as speculative fiction, subject formation, comparative diasporan literatures, gender issues, theoretical and critical approaches or formal innovations.

873 [288] SEMINAR IN THE LITERATURE OF THE U.S. SOUTH (3). An in-depth treatment of selected writers of the U.S. South, focusing on a single genre or historical period.

874 [388] LITERATURE OF THE U.S. SOUTH: SPECIAL TOPICS (3). An in-depth treatment of selected topics (e.g., the Southern Renaissance, postmodern southern fiction, the racial conversion narrative) in Southern literature.

876 INTRODUCTION TO MODERN IRISH I (3). An introduction to modern Irish grammar.

877 INTRODUCTION TO MODERN IRISH II (3). Prerequisite, ENGL 876. Readings in modern Irish literature.

878 CRITICAL IRELAND (3). This course explores the creation of Irish culture in literature and history through the medium of 20th-century critical texts.

879 WRITING THE NORHTERN IRISH TROUBLES (3). This course examines literature's response to "the troubles" in Northern Ireland, that outbreak of civil violence which has taken place, most recently, since 1968.

880 [294] IRELAND IN MODERNITY (3). This course will examine the relationships between Irish writing, culture and modernism, in the context of international developments in literature and art.

881 STUDIES IN CINEMA (3). This course offers graduate students the opportunity to investigate, in a seminar setting, a particular subject within the domain of film studies.

886 SEMINAR IN ECOLOGICAL THEORY AND PRACTICE (3). In-depth evaluation of ecological theory, ecocritical pedagogy and literary criticism.

990 [397] DIRECTED READINGS (3). Topics vary according to the needs and interests of the individual student and the professor directing the reading and writing project.

992 [392] NONTHESIS OPTION (3).

993 [393] MASTER'S THESIS (3–6).

994 [394] DOCTORAL DISSERTATION (3–9).

Comparative Literature

Courses for Graduates and Advanced Undergraduates

A. Period Courses

450 [150] MAJOR WORKS OF 20TH-CENTURY LITERARY THEORY (3). Comparative study of representative works on literary and cultural theory or applied criticism to be announced in advance. Koelb, McGowan, Leonard.

452 [170] THE MIDDLE AGES (3). Study of selected examples of Western medieval literature in translation, with particular attention to the development of varieties of sensibility in various genres and at different periods. Kennedy.

454 [172] LITERATURE OF THE CONTINENTAL RENAISSANCE IN TRANSLATION (3). Discussion of the major works of Petrarch, Boccaccio, Machiavelli, Castiglione, Ariosto, Tasso, Rabelais, Ronsard, Montaigne, Cervantes, and Erasmus. Wolfe.

456 [174] THE 18TH-CENTURY NOVEL (3). English, French and German 18th-century narrative fiction with emphasis on epistolary novel. The relation of the novel to the Enlightenment and its counterpart, the cult of sentimentality and on shifting paradigms for family education, gender and erotic desire. Downing.

458 [173] SENSE, SENSIBILITY, SENSUALITY, 1740–1810 (3). The development of the moral aesthetic of sensibility or Empfindsamkeit in literature of western Europe in the late 18th and early 19th centuries. Brodey.

460 [175] ROMANTICISM (3). An exploration of the period concept of Romanticism, using selected literary works by such writers as Blake, Wordsworth, Coleridge, Goethe, Novalis, Schlegel, Hugo, Nerval, Chateaubriand. Furst.

462 [176] REALISM (3). An exploration of the period concept of Realism through selected works by such writers as George Eliot, Dickens, James, Dostoevsky, Tolstoy, Balzac, Stendhal, Flaubert, Zola. Furst.

464 [177] NATURALISM (3). The Naturalist movement in European and American literature of the late 19th and early 20th centuries, focusing on its philosophical, psychological and literary manifestations in selected plays and novels. Furst.

466 [178] MODERNISM (3). An exploration of the period concept of modernism in European literature, with attention to central works in poetry, narrative and drama, and including parallel developments in the visual arts. Leonard.

468 [181] AESTHETICISM (3). Aestheticism as a discrete 19th-century movement and as a major facet of modernism in literature and literary theory. Authors include Kierkegaard, Baudelaire, Nietzche, Huysmans, Wilde, Mann, Rilke, Nabokov, Dinesen, Barthes, Sontag. Downing.

496 [140] READING COURSE (1–21). Readings vary from semester to semester. The course is generally offered for three credits. Staff.

B. Genre Courses

470 [180] CONCEPTS AND PERSPECTIVES OF THE TRAGIC (3). History and theory of tragedy as a distinctive literary genre and as a more general literary and cultural problem. Authors include Aeschylus, Sophocles, Euripides, Shakespeare, Racine, Goethe, Nietzsche, Wagner, Mann, Samuel I and II, Faulkner. Also engages theorists, ancient and modern. Downing.

472 [184] THE DRAMA FROM IBSEN TO BECKETT (3). The main currents of European drama from the end of the 19th century to the present. Includes Chekhov, Strindberg, Pirandello, Lorca, Brecht, Anouilh.

476 [191] AUTOBIOGRAPHY AS A LITERARY FORM (3). The rise and evolution of interest in the self in literary forms from St. Augustine's to Rousseau's Confessions and from Abelard through Dante, Petrarch, Cellini and Montaigne. Cervigni.

485 [185] APPROACHES TO 20TH-CENTURY NARRATIVE (3). An examination of central trends in 20th-century narrative. Leonard.

C. Special Topic Courses

481 [182] RHETORIC OF SILENCE: CROSS-CULTURAL THEME AND TECHNIQUE (ASIA 481) (3). The uses of literary silence for purposes such as protest, civility, joy, oppression, nihilism, awe or crisis of representation. Authors include Sterne, Goethe, Austen, Kawabata, Soseki, Oe, Toson, Camus, Mann. Brodey.

482 [142] PHILOSOPHY IN LITERATURE (PHIL 482) (3). Philosophical readings of literary texts, including novels, plays and poems.

483 [183] CROSS-CURRENTS IN EAST-WEST LITERATURE (ASIA 483) (3). The study of the influence of Western texts upon Japanese authors and the influence of conceptions of "the East" upon Western writers. Goldsmith, Voltaire, Soseki, Sterne, Arishima, Ibsen, Yoshimoto, Ishiguro. Brodey.

486 [186] LITERARY LANDSCAPES IN EUROPE AND JAPAN (ASIA 486) (3). Changing understandings of nature across time and cultures, especially with regard to its human manipulation and as portrayed in novels of Japan and Europe. Rousseau, Goethe, Austen, Abe, Mishima. Brodey.

487 [190] LITERATURE AND THE ARTS OF LOVE (3). Love and sexuality in literary works from various historical periods and genres. Authors include Sappho, Plato, Catullus, Propertius, Ovid, Dante, Petrarch, Shakespeare, LaClos, Goethe, Nabokov and Roland Barthes. Downing.

490 [195] SPECIAL TOPICS (3). Topics vary from semester to semester. Staff.

492 [192] THE FOURTH DIMENSION: ART AND THE FICTIONS OF HYPERSPACE (3). An exploration of the concept of the fourth dimension, its origins in non-Euclidean geometry, its development in popular culture and its impact on the visual arts, film and literature. Leonard.

560 [160] READING OTHER CULTURES: ISSUES IN LITERARY TRANSLATION (SLAV 560) (3). Prerequisite, reading knowledge of a language other than English. Starting from the proposition that cultural literacy would be impossible without reliance on translations, this course addresses fundamental issues in the practice, art and politics of literary translation.

621 [153] ARTHURIAN ROMANCE (ENGL 621) (3). British and continental Arthurian literature in translation from the early Middle Ages to Sir Thomas Malory.

685 [179] LITERATURE OF THE AMERICAS (AMST 685, ENGL 685) (3). Prerequisite, two years of college-level Spanish or the equivalent. Multidisciplinary examination of texts and other media of the Americas, in English and Spanish, from a variety of genres.

Courses for Graduates

CMPL 700 [201] PROBLEMS AND METHODS IN COMPARATIVE LITERATURE (3). The course deals with the history of comparative literature, bibliographical materials, orientations of the subject in Europe and America, and problems of methodology, periodization, literary movements and concepts of literary theory. Fall.

CMPL 737 [202] TOPICS IN CONTEMPORARY LITERARY AND CULTURAL THEORY (SPAN 737) (3). Selected critical topics in poststructuralist thought, chosen by the instructor and announced in advance. Polo de Bernabé.

CMPL 796 [240] READING COURSE (1–21). Staff.

CMPL 821 [221] READING IRONIES (3). Study of processes of recognizing and constructing ironies in texts, with consideration of both theoretical issues and practical readings.

CMPL 841 [241] HISTORY OF LITERARY CRITICISM I: CLASSICISM (3). Study of Platonism, Aristotelianism, Ciceronianism and Horatianism as critical traditions from antiquity to the 18th century. Downing, Koelb.

CMPL 842 [242] HISTORY OF LITERARY CRITICISM II: 1750–1950 (3). Study of major theoretical and critical writings in Europe from the middle of the 18th to the early 20th century. McGowan, Koelb.

CMPL 843 [243] 20TH-CENTURY LITERARY THEORY (3). An overview of major theoretical developments of the 20th century, including such movements as Saussurean linguistics, Russian Formalism, Prague Circle Semiotics, poststructuralism, phenomenology, psychoanalysis, feminism and Marxism. Leonard.

CMPL 844 MODERN WOMEN WRITERS (3).

CMPL 890 [295] SPECIAL TOPICS IN COMPARATIVE LITERATURE (3). Fall or spring. Staff.

CMPL 892 [309] INTERDISCIPLINARY SEMINAR IN RENAISSANCE STUDIES (3). Topic announced annually in advance. Collins.

CMPL 894 [310] SEMINAR (3). Topic announced annually in advance. Staff.

CMPL 900 [395] RESEARCH. Staff.

CMPL 993 [393] MASTER'S THESIS (3–6). Fall and spring. Staff.

CMPL 994 [394] DOCTORAL DISSERTATION (3–9). Fall and spring. Staff.

Cross-Listed Courses

CMPL 435 [135] CONSCIOUSNESS AND SYMBOLS (ANTH 435, FOLK 435) (3). Peacock.

CMPL 482 [142] PHILOSOPHY IN LITERATURE (PHIL 482) (3).

CMPL 535 BOCCACCIO AND NARRATIVE (ITAL 735) (3).

CMPL 560 [160] LITERARY TRANSLATION (SLAV 560) (3). Levine.

CMPL 621 [153] ARTHURIAN ROMANCE (ENGL 621) (3). Kennedy.

CMPL 685 [179] LITERATURE OF THE AMERICAS (ENGL 685) (3). DeGuzman.

CMPL 741 SPANISH AMERICAN ESSAYS AND SHORT STORIES (SPAN 741) (3).

CMPL 745 VANGUARDS (SPAN 745) (3).

CMPL 747 CONTEMPORARY NOVEL (SPAN 747) (3).

Department of Exercise and Sport Science

www.unc.edu/depts/exercise
KEVIN M. GUSKIEWICZ, *Chair*

Professors
Kevin M. Guskiewicz (24) Sports Medicine, Anatomy
Anthony C. Hackney (21) Exercise Physiology, Metabolism and Endocrinology
Robert G. McMurray (13) Exercise Physiology
Frederick O. Mueller (07) Sport Administration, Sports Medicine
William E. Prentice (15) Athletic Training, Sports Medicine

Associate Professors
Diane G. Groff (34) Recreation and Leisure Studies
Bonita L. Marks (26) Exercise Physiology
Barbara Osborne (29) Legal Issues, Sport Administration
Darin A. Padua (22) Anatomy, Biomechanics, Sports Medicine
Edgar W. Shields Jr. (10) Applied Statistics, Research Design

Assistant Professors
Claudio L. Battaglini (32) Clinical Exercise Physiology, Exercise Assessment and Prescription
J. Troy Blackburn (33) Biomechanics, Neuromuscular Control, Sports Medicine
Michael D. Lewek, Biomechanics
Joseph B. Myers (35) Anatomy, Biomechanics, Sports Medicine
Richard M. Southall (37) College Sports Marketing and Management
Steven M. Zinder (36) Anantoy, Biomechanics, Sports Medicine

Adjunct Professors
Robert Cantu, Neurosurgery
Timothy Taft, Sports Medicine

Adjunct Associate Professors
Daniel Hooker, Sports Medicine
William T. Generous, Physical Education
Laurence M. Katz, Emergency Medicine
Stephen W. Marshall, Epidemiology

Adjunct Assistant Professor
Elizabeth Hedgpeth (30) Sport Psychology

Visiting Assistant Adjunct Professor
Deborah L. Stroman, Financial Management, Leadership, Sports Marketing

Professors Emeriti
M. Deborah Bialeschki
John E. Billing
Frank Pleasants Jr.

Mission

The mission of the Department of Exercise and Sport Science (EXSS) is to discover, create and promote knowledge of human movement to improve the quality of life of individuals and society. We prepare individuals to function as scientists, educators and practitioners. Our program offers a master of arts degree in each of three specialization areas: athletic training, exercise physiology or sport administration. We seek to provide students focused, in-depth knowledge and skills, and an understanding of the challenges facing the areas of athletic training, exercise physiology and sport administration as well as a global understanding of exercise and sport.

In pursuit of maximum fulfillment of our mission, we also offer quality practical experiences to our students. EXSS has an association with numerous other campus and local area units such as athletics, emergency medicine, orthopaedics, the Lineberger Comprehensive Cancer Center, HEELS for Health, Campus Health Services, Carolina Adventures, Campus Recreation, the North Carolina High School Athletic Association and local public parks and recreation departments. Supervised assistantships and internships outside the department help students develop practical skills in the specific fields of study. Furthermore, the thesis, a required research experience, is an integral part of every student's program of study. Additional research experience opportunities are numerous, and it is an expectation of the department that graduate students will become actively involved in conducting research while studying at UNC-Chapel Hill.

Additional information regarding the Department of Exercise and Sport Science can be found at www.unc.edu/depts/exercise.

Specialization Descriptions

Athletic Training

The mission of the athletic training specialization is to develop outstanding athletic training clinicians, teachers and researchers. This specialization is one of only 13 programs in the United States accredited by the National Athletic Trainers' Association (NATA). We recruit graduate students who are NATA Board of Certification certified athletic trainers or who have completed requirements for certification by NATA. We provide the means for each graduate student to gain advanced knowledge and experience in a chosen area of expertise through a combination of didactic lecture in the classroom, supervised practical application of this knowledge in a clinical setting, and a strong research experience oriented toward clinical practice. All students admitted to this program serve as graduate assistant athletic trainers in the UNC-Chapel Hill Department of Athletics. Strong research and practical experience in the

prevention, evaluation, management and rehabilitation of athletic-related injuries are provided to all students. Thirty-four hours of graduate course work are required, including a minimum of 22 hours specific to athletic training/sports medicine: EXSS 479, 730, 732, 733, 735, 736, 739.*

Go to www.unc.edu/depts/exercise/sport_medicine.htm for additional information.

Exercise Physiology

The mission of the exercise physiology specialization is to prepare individuals for careers in the wellness industry, including hospital and corporate fitness centers as well as clinical settings, or to pursue research careers in exercise physiology related fields. Students seeking a focus in fitness/wellness are provided the background, knowledge, testing skills and practical experience to prescribe safe fitness/wellness programs in a variety of settings, as well as the knowledge to act as a liaison between the medical community and the layperson regarding the health implications of exercise. Students preparing for further advanced study in a Ph.D. program are provided in-depth understanding of how physiological constructs are applied to exercise and the environment, as well as an understanding of the research process. Concomitantly, the student develops laboratory techniques and skills. Many graduate students present their thesis research findings at national and regional meetings of the American College of Sports Medicine, and at other professional meetings or conferences. Thirty-one hours of graduate coursework are required, including a minimum of 21 hours specific to exercise physiology: EXSS 410, 780, 781, 782, 783, 785 and 789.*

Go to www.unc.edu/depts/exercise/exercise_physiology.htm for additional information.

Sport Administration

The mission of the sport administration specialization is to prepare students for leadership positions in collegiate-level athletic administration. This program combines formal course work and practical experiences with a full-time, one-year internship in an administrative capacity with the UNC-Chapel Hill Athletics Department. Thirty-two hours of graduate coursework are required, including a minimum of 20 hours specific to sport administration: EXSS 740, 744, 746, 748, 749, 750, 751.*

Go to www.unc.edu/depts/exercise/sport_administration.htm for additional information.

Law and Sport Administration Dual Degree Program (J.D./M.A.)

The dual degree program provides an opportunity for students who are interested in both law and sport administration to earn both degrees over four years of study. Students benefit from a respected law curriculum, combined with a sport administration curriculum with a unique focus on intercollegiate athletics. There is a growing market in college athletics for professionals with both degrees. Graduates of the dual degree program are likely to work in athletic compliance and enforcement at a university, conference office or national governing body such as the National Collegiate Athletic Association (NCAA). Legal positions in athletic departments, fundraising and development, and at law firms that represent colleges and conferences are also likely. Students must be currently enrolled in their second year at the UNC-Chapel Hill School of Law to apply for the Law/EXSS dual degree program. Students must apply and be accepted by both the School of Law and the Department of Exercise and Sport Science, and will be responsible for paying tuition and fees separately to each program.

* Departmental Requirements

In addition to specialization course requirements (see above), statistics and research methods (EXSS 700, 705 and 993) are required of all graduate students in the Department of Exercise and Sport Science. Other formal requirements for the master's degree include passing the written comprehensive examination covering content specific to the student's specialization, as well as statistics and research methods, a formal written thesis and an oral defense of the thesis.

Admission

The master's degree programs in Exercise and Sport Science are open to individuals from differing backgrounds. However, the majority of past entrants into the program have earned undergraduate degrees in exercise science, kinesiology, physical education or recreation/leisure studies. The department offers only fall admission. The department does not admit non-degree-seeking students. Candidates should check with the department for admission information pertaining to their specific area of specialization.

Go to www.unc.edu/depts/exercise for additional information.

Ph.D. Study

An interdisciplinary doctoral program in human movement science is offered with the cooperative effort of the following departments at UNC-Chapel Hill: Allied Health Sciences—Division of Physical Therapy; Exercise and Sport Science; Biomedical Engineering; Physical Medicine and Rehabilitation; Orthopedics; and the Program on Aging.

This curriculum is designed to provide students an opportunity for doctoral study in areas that will increase knowledge of human movement performance. The program focuses on contributing to the scientific basis of human movement, developing theory and methods for maintaining health, preventing disability and improving movement ability. Areas of concentration include 1) biomechanics of human movement, 2) physiology of human movement and 3) neuromuscular control of human movement.

Go to www.alliedhealth.unc.edu/hmsc for additional information.

Assistantships

The Department of Exercise and Sport Science awards a number of graduate assistantships annually to help fund students' education and to provide practical experiences related to their area of study. Assistantships may involve any of the following activities or combination of activities: exercise and fitness instructor, certified athletic trainer, cardiovascular rehabilitation consultant, athletic department assistant, recreation programmer, recreation research assistant, or teaching assistant in exercise and sport science. Students wishing to apply for one of these assistantships should complete and return the appropriate application form. Contact the administrative assistant in the Department of Exercise and Sport Science for additional information at (919) 962-0018.

Courses for Graduate Students

EXSS 410 [110] EXERCISE PRESCRIPTION AND TESTING IN A HEALTHY POPULATION (3). Prerequisites, EXSS 175, 276 and 376. Methods and protocols for screening, evaluating and prescribing exercise. Must take the laboratory section along with the class. Spring. Battaglini, Marks, McMurray.

EXSS 412 [112] EXERCISE PRESCRIPTION IN CLINICAL POPULATIONS (3). Prerequisites, EXSS 175, 276, 376 and 410. Introductory course in the theoretical basis of exercise testing and prescription for clinical populations, enabling students to develop safe and effective exercise programs for diseased populations.

EXSS 476 [114] THEORY AND APPLICATION OF STRENGTH TRAINING AND CONDITIONING FOR FITNESS PROFESSIONALS (3). Prerequisites, EXSS 175 and 276. This is an intermediate- to upper-level course designed to provide students with theoretical and practical knowledge of the physiological, biomechanical, functional and administrative aspects of designing and supervising conditioning programs for various populations. Fall and spring. Graduate faculty.

EXSS 478 [116] PERFORMANCE ENHANCEMENT FOR FITNESS PROFESSIONALS (3). Prerequisites, EXSS 175, 276 and 380. An upper-level course designed to provide students who have a fitness background with the theoretical and practical knowledge related to the Performance Enhancement Specialization for athletes of all ages. Spring and summer. Graduate faculty.

EXSS 479 PERFORMANCE ENHANCEMENT SPECIALIZATION FOR HEALTH PROFESSIONALS (1). Prerequisites, EXSS 175, 276, 366 and 368. An upper-level course designed to provide students who have a health profession background with the theoretical and practical knowledge related to the Performance Enhancement Specialization for athletes.

EXSS 700 [220] APPLIED STATISTICS AND RESEARCH METHODS IN EXERCISE AND SPORT SCIENCE (3). Prerequisite, undergraduate statistics course. Applied statistical analysis and interpretation of data from the field of exercise and sport science. Selected statistical techniques and methods, with emphasis on choosing proper method of analysis, using statistics software to create data sets, run analyses and produce proper output. Major topics include experimental and nonexperimental research design, sampling, hypothesis formulation and testing, power calculation, t-tests, ANOVA, correlation, simple and multiple regression and chi square within the context of planning, conducting, writing and reporting of research in the field of EXSS. Fall and spring. Shields.

EXSS 705 [225] APPLIED STATISTICS AND RESEARCH METHODS LABORATORY (3). Prerequisite, undergraduate statistics course required. Builds heavily upon material presented in EXSS 700. Planning, conducting and reporting of research. Thesis writing and writing for publication. Problem-solving and practical experience in applied statistical analysis, interpretation and presentation of data from the field of exercise and sport science. Fall and spring. Guskiewicz, McMurray, Shields.

EXSS 730 [230] MANAGEMENT OF ATHLETIC INJURIES (3). Prerequisite for nonmajors, permission of the instructor. Designed to provide basic knowledge and skill that aid in the prevention and treatment of injuries common to athletics. Fall. Prentice.

EXSS 732 [232] HUMAN ANATOMY FOR ATHLETIC TRAINERS (4). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The study of gross human anatomy, with emphasis on the functional and clinical aspects of the neck, back and extremities as related to athletic injuries. Fall. Guskiewicz.

EXSS 733 [233] PSYCHOLOGICAL CONSIDERATIONS FOR INJURY AND REHABILITATION (3). Prerequisite, athletic training graduate students. This seminar is designed to assist the athletic training graduate student in exercise and sport science to understand the psychological impact that injury and rehabilitation has on the injured athlete. The stress resulting from injury will be addressed, along with a working knowledge of coping skills to deal with the rigors of rehabilitation. The athletic training graduate student will learn to improve communication skills in order to improve the relationship between the athletic trainer, the injured athlete and the injured athlete's coach. Fall. Hedgpeth.

EXSS 735 [235] SPORTS MEDICINE ANALYSIS: SPECIAL PROBLEMS RELATED TO SPORTS MEDICINE (3). Prerequisite, permission of the instructor for nonmajors. Problem and research oriented. Spring. Prentice.

EXSS 736 [236] CLINICAL METHODS IN ATHLETIC TRAINING (3). Prerequisite, EXSS 730. Analysis of theories and techniques used in clinical sports medicine settings. Spring. Prentice.

EXSS 737 [237] ADVANCED MUSCULAR ASSESSMENT AND TREATMENT (3). Prerequisites, EXSS 730, EXSS 732, EXSS 736, permission of the instructor. Discussion of mechanical properties and healing of musculoskeletal tissues throughout the life cycle, and laboratory/seminar units concerned with assessment and treatment of musculoskeletal pathology. Fall. Gross.

EXSS 739 [239] PRACTICUM IN ATHLETIC TRAINING (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The implementation of theories and practices in a professional setting under the direction of a competent practitioner. Spring. Prentice.

EXSS 740 [240] ADMINISTRATION OF SPORT (3). Prerequisite, instructor's permission for nonmajors. Policies and problems of organization and administration of athletic programs in colleges. Fall. Mueller.

EXSS 742 [255] SOCIAL ISSUES IN EXERCISE AND SPORT (3). A comprehensive study of race and gender discrimination, adherence, value development, violence and other socialization factors in youth, collegiate and Olympic sport. Fall. Hyatt.

EXSS 744 [248] COLLEGIATE SPORT MARKETING (3). Prerequisite, graduate standing. This course is designed to develop a thorough understanding of sport marketing principles and their application to collegiate athletics. Spring. Tomasini.

EXSS 746 [246] ORGANIZATIONAL AND FINANCIAL MANAGEMENT OF SPORT (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The study of administrative structures and financial concerns of collegiate athletic programs. An intensive study of NCAA regulations is included. Fall. Tomasini.

EXSS 748 [244] LEGAL ISSUES IN COLLEGIATE SPORT (3). Provides an introduction to the United States legal system, legal principles and legal issues related to intercollegiate athletics. Fall. Osborne.

EXSS 749 [249] NCAA GOVERNANCE AND COMPLIANCE (3). Prerequisite, EXSS 740. The implementation of theories and practices in a professional setting under the direction of a competent practitioner. Spring. Osborne.

EXSS 750 SPORT ADMINISTRATION LEADERSHIP SEMINAR I (1). Successful completion of first year in sport administration graduate program. An introduction of organizational leadership concepts in a practical applied context. Students will lead class discussion tying relevant current events with leadership theory.

EXSS 751 SPORT ADMINISTRATION LEADERSHIP SEMINAR II (1). Successful completion of first year in sport administration graduate program. An introduction of organizational leadership concepts in a practical applied context. Students will lead class discussion tying relevant current events with leadership theory.

EXSS 770 [270] MOTOR LEARNING (3). Prerequisite, EXSS 380 or permission of the instructor. A study of the physical and psychological factors that influence skill acquisition and performance in sport and exercise, including applications to teaching and coaching. Spring. Graduate faculty.

EXSS 780 [280] PHYSIOLOGY OF EXERCISE (4). Prerequisite, EXSS 276, 376 or equivalent. The study of the physical, biochemical and environmental factors that influence human performance. Emphasis is placed on metabolic, cardiovascular, respiratory, muscular and endocrine systems. Three hours of lecture and two hours of laboratory per week. Fall. Hackney, McMurray.

EXSS 781 [281] CLINICAL EXERCISE PRESCRIPTION AND TESTING (3). Prerequisite, EXSS 376, 410 or permission of the instructor; pass EXSS 410 with B or equivalent. This course concentrates on the knowledge and skills necessary for providing exercise testing and prescription in the clinical setting, emphasizing cardiac rehabilitation. Fall. Battaglini, Marks, McMurray.

EXSS 782 [282] NUTRITIONAL ASPECTS OF EXERCISE (3). Prerequisite, graduate standing in physical education or permission of the instructor. Exploration of the role of macronutrients and micronutrients as they apply to exercise, physical conditioning and competition. Students obtain experience in dietary analysis as it applies to athletic populations. Spring. McMurray.

EXSS 783 [283] ASSESSMENT OF PHYSIOLOGICAL FUNCTIONS IN EXERCISE (3). Prerequisites: EXSS 780 or equivalent, permission of the instructor. Designed to develop laboratory techniques and experimental design skills as applied to the physiology of human performance. Spring. Hackney, McMurray.

EXSS 785 [285] SEMINAR IN EXERCISE PHYSIOLOGY (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. In-depth study of selected advanced topics in exercise physiology. Emphasis on metabolism, biochemical and cardiorespiratory physiology, with student presentations on selected topics. Fall. Hackney, McMurray.

EXSS 789 [289] PRACTICUM IN EXERCISE PHYSIOLOGY (3). Prerequisite, EXSS 410, 780 or 781, or permission of the instructor. The implementation of theories and practices of fitness or cardiac rehabilitation in a professional setting under the direction of an experienced practitioner. Fall and spring. Battaglini, Hackney, Marks, McMurray.

EXSS 890 [300] SPECIAL TOPICS IN EXERCISE AND SPORT SCIENCE (1–3). Prerequisite, graduate standing or permission of the instructor. The study of special topics directed by an authority in the field. Fall and spring. Graduate faculty.

EXSS 990 [320] RESEARCH IN EXERCISE AND SPORT SCIENCE (1–3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. Individually designed research projects conducted by students under the direction of a graduate faculty member. Fall and spring. Graduate faculty.

EXSS 993 [393] MASTER'S THESIS (3–6). Fall, spring and summer. Graduate faculty.

Graduate Recreation Degree Course Work

RECR 710 [210] LEISURE AND ORGANIZED RECREATION IN THE UNITED STATES (3). An analysis of the scope of leisure research, recreation services, the evolution of leisure and the of individual recreation behavior.

RECR 770 [270] ADMINISTRATION OF THERAPEUTIC RECREATION SERVICES (3). Emphasis on information specific to the administration of therapeutic recreation such as fiscal management, quality assurance, evaluation, marketing of therapeutic recreation and other general administrative topics.

RECR 775 [275] PRINCIPLES AND PROCEDURES IN THERAPEUTIC RECREATION (3). A study of the existing practices and principles of therapeutic recreation. An in-depth treatment of assessment/evaluation, goal setting and individualized planning, documentation, leisure counseling and clinical skills.

RECR 790 [290] INDEPENDENT FIELD STUDY (3). Permission of faculty required. May be repeated for credit.

RECR 830 [230] MANAGING ORGANIZATIONAL BEHAVIOR IN RECREATION SERVICES (3). This course addresses organizational behavior and theory to promote insight into micro and macro issues confronting professionals in organized recreation services.

RECR 865 [365] ISSUES AND TRENDS IN RECREATION MANAGEMENT (3). A seminar to involve graduate recreation students in in-depth analyses of selected topics, issues and problems relevant to the recreation management in public and not-for-profit leisure service organizations.

RECR 876 [376] ISSUES AND TRENDS IN THERAPEUTIC RECREATION (3). An analysis of selected issues, problems and concerns in the provision of therapeutic recreation and inclusive recreation services.

RECR 880 [280] INTERNSHIP IN RECREATION ADMINISTRATION (2).

RECR 881 [281] INTERNSHIP IN RECREATION ADMINISTRATION (2).

RECR 890 [310] SEMINAR IN LEISURE STUDIES (3). A survey of contemporary views of society and their structures and functions, as they relate to concepts of leisure and recreation behaviors.

RECR 950 [250] RECREATION RESEARCH DESIGN AND METHODS I (3). An appraisal of current recreation and leisure research design using both quantitative and qualitative data. Students complete and deliver a formal research proposal.

RECR 951 [251] RECREATION RESEARCH AND DESIGN AND METHODS II (3). Prerequisites, RECR 950 and a statistics course. Students analyze quantitative and qualitative data and apply their work to theory and practice. Students complete the research proposed in RECR 950.

RECR 992 [393] MASTER'S THESIS (3–6). Fall, spring and summer. Graduate faculty.

Other RECR courses that may be useful and of interest to graduate students:

RECR 310 [101] WOMEN, WORK AND LEISURE (3). Implications of the relationship between women and leisure from a lifestyle perspective, and an analysis of the changing role of women and changing leisure concepts from a feminist perspective.

RECR 475 DISABILITY, CULTURE AND THERAPEUTIC RECREATION (3). An examination of disability from a cultural perspective with the application of theoretical and scientific knowledge to provide recreation interventions that facilitate participation in life by individuals with disabilities.

RECR 790 [290] INDEPENDENT FIELD STUDY (3). Permission of faculty required. May be repeated for credit.

RECR 830 [230] MANAGING ORGANIZATIONAL BEHAVIOR IN RECREATION SERVICES (3). This course addresses organizational behavior and theory to promote insight into micro and macro issues confronting professionals in organized recreation services.

RECR 880 [280], 881 [281] INTERNSHIP IN RECREATION ADMINISTRATION (2 each).

Program in Folklore

www.unc.edu/depts/folklore

PATRICIA SAWIN, *Director of the Folklore Program, Department of American Studies*

Professors

*Bob Cantwell (26) Culture and Human Rights, Vernacular Music, Folklore Theory, Sexual Consent, Jane Addams, Pragmatism and the Progressive Era
Carole L. Crumley (22) Archaeology, Complex Societies, Europe
Terence Evens (27) Social Anthropology, Social Theory, Phenomenology, Ethics, Philosophical Anthropology, Collectivist Settlements
*William R. Ferris (70) Southern Music and Literature, Documentary Studies, American South
Kaja Finkler (32) Medical Anthropology, Latin America
Jacquelyn Hall (18) American History, Southern Oral History
*Trudier Harris (5) African American Folklore and Literature
Norris B. Johnson (25) Cultural Anthropology, Art and Literature
Edward Donald Kennedy (6) Medieval Romances, Arthurian Literature
H. Craig Melchert (23) Indo-European Linguistics
Patrick P. O'Neill (20) Medieval Literature, Celtic Languages and Culture
James L. Peacock (11) Culture Change, Symbolic Systems, Southeast Asia
Della Pollock (9) Performance of Literature, Performance Theory and Criticism, Cultural Studies
Ruel W. Tyson Jr. (15) Philosophy and Anthropology of Religion

Associate Professors

Robert Edward Daniels (4) Social Anthropology, Culture and Personality, Africa
John W. Florin (16) Population Geography, Medical Geography and Historical Anglo-America
*Jocelyn Neal (7) 20th-Century Theory, Popular Music

*Glenn D. Hinson (36) Ethnography, African American Expressive Culture, Belief Systems, Vernacular Art, Public Folklore, American South
Valerie Lambert (59) American Indians, Ethnography, Political and Legal Anthropology, Sovereignty, Identity, Race and Racism, Elites, United States
*Patricia E. Sawin (52) Gender Theory, Narrative, , Ethnography of Speaking, Politics of Culture, Festival, Culture and Globalization, Appalachia, Guatemala
Karla Slocum (56) Global/Local Studies, Social Movements, Agency, Development, Gender, Applying Anthropology, Caribbean

Assistant Professors

*Marcie Ferris (35) Southern Jewish History, American Foodways, Women's Studies, Folklore, Material Culture
Christopher Nelson (64) History and Memory, Everyday Life, Ethnography, Critical Theory, Storytelling, Ritual and Performance, Japan and Okinawa
*Katherine Roberts (15) Material Culture, Environment and Place, Vernacular Architecture, American South

Professors Emeriti

Daniel W. Patterson, Ballads, American Folksong, Religious Folklife, Gravestones, American South
Charles Gordon Zug, Pottery, Material Culture, Narrative, Maritime Folklife, Folk Art, American South
** core faculty*

The Folklore Program focuses on the study of creativity and aesthetic expression in everyday life, and on the social and political implications of this expression as it unfolds in the contested arenas of culture. Not bound to traditional definitions of folklore, and committed to preparing students for ethical practice in a multicultural world, the Folklore Program offers a flexible M.A. program that readies students for both public practice and further academic study.

The millennium's turn marked five decades of the Folklore Program's presence at UNC-Chapel Hill. Founded with an eye to regional study and deeply integrated with the University's long-standing focus on Southern history, literature and culture, the program maintains its commitment to the study of regional folklife. This commitment, however, in no way limits the program's vision. Though students and faculty still do much of their fieldwork in the South, they are just as likely to be working with poets in Chicago, shamans in Siberia or sci-fi costumers in Boston. Faculty interests tend to cluster in the areas of music, language and narrative, African American culture, public folklore, gender, material culture, occupational folklife and the politics of culture. Deeply committed to collaborative work in the public realm, Folklore Program members work extensively with local communities, pursuing projects with museums, arts councils, media production companies and a range of other organizations.

Until last year, the Folklore Program operated as an independent interdisciplinary curriculum, offering a freestanding M.A. in folklore. This year, however, marks the curriculum's merger with the new Department of American Studies. Structurally, the folklore M.A. program will remain largely unchanged; now, however, all of our core faculty will hold joint appointments in American Studies, and students will have a greater set of course options than ever before. Our many affiliated faculty will continue to work with folklore students from their various departmental homes (Anthropology, Communication Studies, English, Geography, History, Linguistics and Religious Studies).The University of North Carolina at Chapel Hill offers a fitting home for the Folklore Program. Its libraries have extensive holdings of books, manuscripts, periodicals, images and sound recordings relating to folklore. Holdings of folklore materials are especially strong for the American South and the British Isles. Particularly notable among these collections are the Archie Green Occupational Folklife Collection, the Don Yoder Collection of American religious tune books, the John Edwards Memorial Collection of early Southern commercially recorded folk and popular music and the Southern Folklife Collection of field and commercial recordings.

Degree Requirements: The M.A. program in folklore stresses flexibility, inviting students to craft a course plan to meet their particular needs. Master's students must complete 10 courses (30 hours). Of these, only two—Introduction to Folklore Theory (FOLK 850) and The Art of Ethnography (FOLK 860)—are required. Other courses must demonstrate a rough balance between genre, theory, area studies and practice. In addition to classes in the core curriculum, students traditionally take courses from a variety of associated graduate programs, including anthropology, communications studies, English, history and music. Students pursuing an M.A. must demonstrate reading proficiency in a foreign language.

Students may also opt for a folklore minor in another Ph.D. program. Students pursuing the minor must complete only six courses.

Courses for Graduates and Advanced Undergraduates

130 [133] ANTHROPOLOGY OF THE CARIBBEAN (ANTH 130) (3). Theories and examples of how Caribbean people live, act and see themselves within various cultural, social, economic and political contexts across time. Attention to North American views of the Caribbean. Spring. Slocum.

230 [130] AMERICAN INDIAN SOCIETIES (ANTH 230) (3). Broad survey of contemporary American Indian societies and cultures in the U.S. Explores sociocultural and historical diversity of tribes through film, autobiography, literature, current issues, guest speakers, archaeology and history. Lambert.

323 [123] MAGIC, RITUAL, AND BELIEF (ANTH 323) (3). Prerequisite, permission of the instructor. Starting with the late 19th century evolutionists, this course discusses, intensively, major anthropological theories of magico-religious thought and practice, then offers an approach of its own. Spring. Evens.

334 [134] ART, MYTH AND NATURE: CROSS-CULTURAL PERSPECTIVES (ANTH 334) (3). Cross-cultural study of form, image and meaning in painting, drawing and sculpture. Emphasis on the interrelationship of religion and art in selected prehistoric and contemporary sociocultural traditions. Spring. Johnson.

375 [176] FOOD IN AMERICAN CULTURE (AMST 375). This course will examine the history and meaning of food in American culture and will explore the ways in which food shapes national, regional and personal identity. M. Ferris.

428 [142] RELIGION AND ANTHROPOLOGY (ANTH 428, RELI 428) (3). Religion studied anthropologically as a cultural, social and psychological phenomenon in the works of classical and contemporary social thought. Spring. Peacock and Tyson.

429 [129] CULTURE AND POWER IN SOUTHEAST ASIA (ANTH 429, ASIA 429) (3). The formation and transformation of values, identities and expressive forms in Southeast Asia in response to forms of power. Emphasis on the impact of colonialism, the nation-state and globalization. Peacock, Nonini, Wiener.

435 [135] CONSCIOUSNESS AND SYMBOLS (ANTH 435, CMPL 435) (3). This course explores consciousness through symbols. Symbols from religion, art, politics and self are studied in social, psychological, historical and ecological context to ascertain meanings in experience and behavior. Fall. Peacock.

454 [154] HISTORICAL GEOGRAPHY OF THE UNITED STATES (GEOG 454) (3). A study of selected past geographies of the United States with emphasis on the significant geographic changes in population, cultural and economic conditions through time. Florin.

455 [155] METHOD AND THEORY IN ETHNOHISTORIC RESEARCH (ANTH 455) (3). Integration of data from ethnographic and archaeological research with pertinent historical information. Familiarization with a wide range of sources of ethnohistorical data and practice in obtaining and evaluating information. Pertinent theoretical concepts are explored. Fall. (Alternate years.) Crumley.

470 [171] MEDICINE AND ANTHROPOLOGY (ANTH 470) (3). This course examines cultural understandings of health, illness and medical systems from an anthropological perspective with a special focus on Western medicine. Finkler.

473 [173] ANTHROPOLOGY OF THE BODY AND THE SUBJECT (ANTH 473) (3). Anthropological and historical studies of cultural constructions of bodily experience and subjectivity are reviewed, with emphasis on the genesis of the modern individual and cultural approaches to gender and sexuality.

484 [184] DISCOURSE AND DIALOGUE IN ETHNOGRAPHIC RESEARCH (ANTH 484, LING 484) (3). Study of cultural variation in styles of speaking applied to collection of ethnographic data. Talk as responsive social action and its role in the constitution of ethnic and gender identities. Sawin.

485 [146] INTRODUCTION TO FOLKLORE (ANTH 485, ENGL 485) (3). An introduction to the study of creativity and aesthetic expression in everyday life, considering both traditional genres and contemporary innovations in the material, verbal and musical arts.

487 [186] FOLK NARRATIVE (ENGL 487) (3). The study of three genres of folk narrative (fairytale, personal narrative and legend) and their distinctive roles in contemporary life.

488 NO PLACE LIKE HOME: MATERIAL CULTURE OF THE AMERICAN SOUTH (3). Seminar will explore the unique worlds of Southern material culture and how "artifacts" from barns to biscuits provide insight about the changing social and cultural history of the American South.

490 [195] TOPICS IN FOLKLORE (3). Topics vary from semester to semester. Fall and spring. Staff.

495 [198] FIELD RESEARCH (3). Research at sites that vary. Fall and spring. Staff.

496 [199] DIRECTED READINGS IN FOLKLORE (3). Prerequisite, permission of the department. Topic varies based on instructor. Fall and spring. Staff.

502 [141] MYTHS AND EPICS OF THE ANCIENT NEAR EAST (RELI 502) (3). Prerequisite, permission of the instructor. An examination of Babylonian, Canaanite, Egyptian, Hittite and Sumerian texts from the prebiblical era, focusing on representative myths, epics, sagas, songs, proverbs, prophecies and hymns. Spring. Sasson.

525 [121] CULTURE AND PERSONALITY (ANTH 525) (3). Systems theory used to conceptualize relationship between cultural patterns and individual minds. Functional, dysfunctional and therapeutic processes considered. Examples from Africa, Asia, Europe and Native America. Lectures, films, recitations. Spring. Daniels.

537 [137] GENDER AND PRACTICE (ANTH 537, WMST 438) (3). A study of the ways in which individuals constitute themselves as gendered subjects in the contemporary context of economic and cultural globalization. Spring. Sawin.

550 [148] INTRODUCTION TO MATERIAL CULTURE (3). An introduction to material folk culture, exploring the meanings that people bring to traditional arts and the artful creations with which they surround themselves (e.g., architecture, clothing, altars, tools, food).

560 [160] SOUTHERN LITERATURE AND THE ORAL TRADITION (3). Course considers how Southern writers employ folklore genres such as folk tales, sermons and music and how such genres provide structure for literary forms like the novel and the short story. Spring. W. Ferris.

562 [161] ORAL HISTORY AND PERFORMANCE (COMM 562, HIST 562, WMST 562) (3). This course combines readings and field work in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history.

565 [165] RITUAL, THEATER, AND PERFORMANCE IN EVERYDAY LIFE (COMM 565) (3). Prerequisite, COMM 160 or ENGL 126. This course will explore the dynamics of performance as it is broadly produced within the texture of individual experiences, the interaction of community memberships and the dramas of cultural aesthetics.

571 [150] SOUTHERN MUSIC (HIST 571) (3). Explores the history of music in the American South from its roots to 20th-century musical forms, revealing how music serves as a window on the region's history and culture. Fall. W. Ferris.

585 [147] BRITISH AND AMERICAN FOLK SONG (ENGL 585) (3). Explores the forms, functions and relationships of British and American folk songs, charting the emergence of Anglo and African American vernacular musics and the dynamic processes of tradition, creolization, innovation and revival.

587 [187] FOLKLORE IN THE SOUTH (ENGL 587) (3). An issue-oriented study of Southern folklore, exploring the ways that vernacular artistic expression (from barns and barbecue to gospel and well-told tales) come to define both community and region.

589 [189] AFRICAN AMERICAN FOLKLORE (ENGL 589) (3). Focuses on the richness and variety of oral traditions that define African American culture, with some emphasis on African origins. Fall. Harris.

610 VERNACULAR TRADITIONS IN AFRICAN AMERICAN MUSIC (AFAM 610) (4). Explores performance traditions in African American music, tracing development from African song through reels, blues, gospel and contemporary vernacular expression. Focuses on continuity, creativity and change within African American aesthetics. (Alternate years.) Fall. Hinson.

670 [174] INTRODUCTION TO ORAL HISTORY (HIST 670) (3). Introduces students to the uses of interviews in historical research. Questions of ethics, interpretation and the construction of memory will be explored, and interviewing skills will be developed through field work. Hall.

675 [175] ETHNOGRAPHIC METHOD (ANTH 675) (3). Intensive study and practice of the core research methods of cultural and social anthropology. Staff.

684 [185] WOMEN IN FOLKLORE AND LITERATURE (ENGL 684, WMST 684) (3). An exploration of representations of women in oral traditions as well as in literature based on oral traditions.

Courses for Graduates

688 [288] OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (ANTH 688, RELI 688) (3). Permission of the instructor. Exercises (including field work) in learning to read the primary modes of public action in religious traditions, e.g., sermons, testimonies, rituals and prayers. Spring. Peacock.

690 [295] STUDIES IN FOLKLORE (3). Topic varies from semester to semester. Fall and spring. Staff.

790 [290] PUBLIC FOLKLORE (3). A graduate seminar addressing theory and praxis in public sector cultural work. Focusing on public folklore, this course explores broad issues of representation, cultural politics and cultural tourism. (Alternate years.) Fall. Hinson.

841 [241] PERFORMANCE ETHNOGRAPHY (COMM 841) (3). This seminar focuses on methods of ethnography and fieldwork ethics. Performance as theory and practice informs methodological inquiries as well as the analysis of specific ethnographic texts and case studies.

842 [342] SEMINAR IN PERFORMANCE AND CULTURAL STUDIES (COMM 842) (3). This course focuses on performance-related issues in the emergent field of cultural studies.

843 [343] SEMINAR IN PROBLEMS IN CONTEMPORARY PERFORMANCE THEORY (COMM 843) (3). An advanced graduate seminar, this course will address recent developments and problems in performance theory. It will consider cross- and multidisciplinary approaches to performance as sites for consideration and debate. Pollock, Long, Madison.

850 [296] APPROACHES TO FOLKLORE THEORY (3). A systematic overview of the major issues and perspectives informing two centuries of folklore study, including social base, tradition, evolution, diffusion, structure, function, interpretation, performance, feminism and ideology. Fall. Sawin.

860 [297] ART OF ETHNOGRAPHY (ANTH 860) (3). A field-based exploration of the pragmatic, ethical and theoretical dimensions of ethnographic research, addressing issues of experience, aesthetics, authority and worldview through the lens of cultural encounter. Field research required. Spring. Hinson.

890 [390] SEMINAR IN SELECTED TOPICS (3). An irregularly offered graduate seminar exploring selected topics in the theory and practice of folklore.

891 [196] TOPICS IN FOLKLORE (3). An irregularly offered graduate seminar exploring selected topics in the theory and practice of folklore.

895 [395] SEMINAR IN FOLKLORE (3). An irregularly offered graduate seminar exploring selected topics in the theory and practice of folklore. Staff.

993 [393] MASTER'S THESIS (3–6). Research in a special field under the direction of staff members. Fall and spring.

Curriculum in Genetics and Molecular Biology

gmb.unc.edu
ROBERT DURONIO, *Director*

Professors

Steven L. Bachenheimer, Alterations to Cell-Cycle and Signal Transduction Pathways following Herpes Simplex Virus Infection
Albert S. Baldwin, Regulation of Gene Expression, Control of Oncogenesis and Apoptosis
Victoria Bautch, Molecular Genetics of Blood Vessel Formation in Mouse Models
Kerry S. Bloom, Mechanisms of Chromosome Segregation in Yeast, Chromosome and Spindle Dynamics
Robert B. Bourret, Molecular Mechanisms of Signal Transduction in Bacteria
Janne G. Cannon, Bacterial Pathogenesis, Antigenic Variation in Pathogenic Bacteria
Adrienne D. Cox, Ras Family Oncogenes and Signaling, Cellular Radiation Response, Lipid Modification and Drug Development
Stephen T. Crews, Neurogenomics and Developmental Neuroscience, Cell Migration and Fusion, Brain Development and Behavior
Jeffery L. Dangl, Plant Disease Resistance and Cell-Death Control, Plant Genomics, Bacterial Pathogenesis and Genomics, Type III Secretion Systems
Channing J. Der, Oncogenes, Ras Superfamily Protein, Signal Transduction
Bob Duronio, Genetics of Cell-Cycle Control during Drosophila Development
Beverly J. Errede, Yeast Molecular Genetics, MAP-Kinease Activation Pathways, Regulation of Cell Differentiation
Rosann A. Farber, Cancer Genetics, Human Molecular Genetics, Somatic-Cell Genetics, Microsatellite Instability
Jeffrey A. Frelinger, Molecular Immunogenetics, Function of the Major Histocompatibility Complex in Virus Infection
Jack D. Griffith, HIV, Transcription, Electron Microscopy
Alan Jones, Arabidopsis, Hormone Perception, Regulation of Growth and Development, Programmed Cell Death
Joseph Kieber, Molecular Genetic Analysis of Hormone Signaling in Arabidopsis
Ryszard Kole, Antisense Oligonucleotides as Chemotherapeutic Agents, RNA Processing, RNA-Protein Interactions
Anthony LaMantia, Control of Gene Expression in the Developing and Adult Central Nervous System
Susan T. Lord, Fibrinogen Structure-Function Analysis, Fibrinogen in Vascular Disease, Modeling Cardiovascular Disease in Mice
Nobuyo Maeda, Genetics Modeling of Atherosclerosis in Mice
Terry Magnuson, Mammalian Genetics, Epigenetics, Genomics
Mark W Majesky, Molecular Basis of Coronary Vessel Development
William F. Marzluff, Regulation of RNA Metabolism in Animal Cells
Gregory A. Matera, Biogenesis of Small Ribonucleoproteins in Health and Disease
Steven W. Matson, Biochemistry and Genetics of DNA Helicases from E. coli and Yeast
Ann G. Matthysse, Genetics of Bacterial Adhesion to Plant Surfaces, Genetics and Biochemistry of Cellulose Synthesis
Deborah O'Brien, Molecular Regulation of Mammalian Spermatogenesis and Fertilization
Leslie V. Parise, Adhesion Receptors and Signaling in Platelets, Sickle Cells and Cancer
Mark Peifer, Cell Adhesion, Signal Transduction and Cancer
Daniel Pomp, Genetic Architecture of Complex Trait Predisposition
Patricia J. Pukkila, Molecular Mechanisms of Chromosome Pairing and Meiosis
R. Jude Samulski, Development of Virus-Based Delivery Systems for Use in Human Gene Therapy
Aziz Sancar, Structure and Function of DNA Repair Enzymes, Biological Clock
Gwendolyn B. Sancar, Regulation of DNA Damage, Stress-Inducible Genes in Eukaryotes
Carolyn Sartor, Role of EGFR and HER2 in radiation response of breast cancer.
Oliver Smithies, Targeted Modification of Genes for Use in Gene Therapy
Lishan Su, T cells during Normal and Pathogenic Hematolymphopoiesis
Patrick Sullivan, Complex Traits in Humans, Psychiatric Genetics, Pharmacogenetics, Twin Studies, Schizophrenia, Major Depression, Nicotine Dependence
Ronald I. Swanstrom, Retroviruses, Molecular Biology of the AIDS Virus
Jenny P. Ting, Transcriptional Regulation of Eukaryotic Genes, Discovery of New Genes in Inflammation and Apoptosis, Functional Genomics and Application to Immunologic and Neurologic Diseases, Chemotherapy, Signal Transduction and Cell Death
Terry A. Van Dyke, Regulation of Cell-Growth Control
Yue Xiong, Cancer Biology, Mammalian Cell Cycle, Tumor Suppressor Genes
Bernard E. Weissman, Tumor Suppressor Genes, Cancer Genetics
Yi Zhang, Chromatin Dynamics, Gene Expression, Cancer

Associate Professors

Shawn Ahmed, Telomere Replication and Germline Immortality in C. elegans
Manzoor Bhat, Genetic and Molecular characterization of Neuron-Glial Interactions in Drosophila and Mouse Model Systems
Patrick Brennwald, Examination of Problems in Membrane Trafficking and Cell Polarity using Genetics
Frank L. Conlon, Mesodermal Patterning and Heart Development, T-box Genes
Blossom Damania, Viral Oncogenes and Transcription Factors Encoded by Kaposi's Sarcoma-Sssociated Herpesvirus
Dirk P. Dittmer, Anti-Lymphoma Therapies
Eric T. Everett, Genetics of Acquired and Congenital Disorders of Craniofacial Development
Bob Goldstein, Generation of Cell Diversity in Early Development of C. elegans
Sarah R. Grant, Plant-Pathogen Interactions
Beverly H. Koller, Generating Animal Models of Human Diseases
Fernando Pardo-Manuel de Villena, Meiotic Drive, Chromosome Segregation, Non-Mendelian Genetics
Charles Perou, Genomic and Molecular Classification of Human Tumors
Larysa Pevny, Transcriptional Mechanisms that Maintain Neural Stem/Progenitor Cell Fate
Lillie L. Searles, RNA Processing Control in Drosophila, Developmental Genetics.

Jeff J. Sekelsky, Genetics of Genome Instability in Drosophila
Dale Ramsden, V(D)J Recombination, DNA Double Strand Break Repair
Jason W. Reed, Plant Development, Auxin signaling, Light Responses
Norman E. Sharpless, Tumor Suppressor Genes, Genetics of Cancer and Aging
David Threadgill, Disease Susceptibility, Mutagenesis, Colon Cancer, Genetic Engineering, Microarrays, Gut Flora
Todd Vision, Genome Evolution and the Architecture of Complex Traits
Ellen R. Weiss, Regulation of G-Protein-Coupled Receptor Signal Transduction Pathways
Brent W. Weston, Molecular Genetics of Glycosyltransferases, Tumor Cell and Leukocyte Adhesion
Kirk Wilhelmsen, Genetic Mapping, Neurodegenerative Diseases
Yanping Zhang, Genetics and Mechanisms of Cancer Cell Growth and Division

Assistant Professors

Miriam Braunstein, Microbial Genetics, Pathogenesis of Mycobacterium Tuberculosis, Protein Export
Jay Brenman, Neuronal Dendrite Development using Drosophila Genetics
Christina Burch, Experimental Evolution in Microorganisms
Kathleen Caron, Genetically Engineered Animal Models in the Study of Human Disease
Jeanette Gowen Cook, Regulation of DNA Replication In Mammalian Cells
Gregory P. Copenhaver, Regulation of Meiotic Recombination in Higher Eukaryotes
Ian Davis, Mechanisms of Transcription Factor Deregulation in Cancer Development.
Morgan Giddings, Computational Proteomics and Systems Biology
Mark Heise, Genetics of Arbovirus Virulence and Immune Evasion
Corbin D. Jones, Population Genetics and Evolution in Drosophila
Tal Kafri, HIV-I Vectors for Gene Therapy and Functional Genomic Applications
William Kim, Exploration of the Role of Hypoxia-Inducible Factor in Tumorigenesis
Ethan Lange, Complex Disease Models, Statistical Genetics
Jason Lieb, Exploring Specificity and Function in Protein-Genome Interactions using DNA Microarrays
Sarah Liljegren, Cell Separation during Arabidopsis Flower Development
C. Ryan Miller, Preclinical Experimental Therapeutics and Biomarker Research in Gliomas
Karen L. Mohlke, Human Genetics and Genomics, Diabetes, Complex Diseases
John Rawls, Host-microbial Interactions in the Zebrafish Digestive Tract
W. Kimryn Rathmell, Genetics of Renal Cell Carcinoma
Steve Rogers, Cyoskeletal Dynamics and Function
Brian Strahl, Histone Modifications and Gene Regulation
Eleni Tzima, Mechanisms of Vascular Endothelial Cell Signaling and Angiogenesis in Response to Hemodynamic Stimuli

Adjunct Associate Professor

Michael A. Resnick (40) Roles of Various DNA Repair in Meiosis

The Curriculum in Genetics and Molecular Biology is an interdepartmental predoctoral training program leading to a Ph.D. degree in genetics and molecular biology. The goal of this program is to train students to be creative, sophisticated research scientists within the disciplines of genetics and molecular biology. To this end we emphasize acquisition of a foundation of knowledge, accumulation of the laboratory skills required for implementing research objectives and development of the ability to formulate experimental approaches to solving contemporary problems in the biological sciences. During their first year, students enroll in graduate-level courses and participate in laboratory rotations. Subsequently, students select a faculty research advisor and establish an advisory committee. Research work is done in the laboratory facilities of the individual faculty member and is supported primarily by faculty research grants.

The curriculum faculty have appointments in 13 departments in the School of Medicine, the School of Dentistry and the College of Arts and Sciences. The faculty represent diverse research interests that use the tools of genetics, molecular biology and biochemistry to address fundamental question in the areas of cell cycle regulation, chromosome structure, development and disease models, DNA repair and recombination, genome stability, evolutionary genetics, genomics, human genetics, neurobiology, pathogens and immunity, signal transduction, transcription and gene regulation and virology. Students are able to choose from a variety of biological systems and questions for their thesis research.

Requirements for Admission for Graduate Work

Applications from students with good academic records and interest in research careers in genetics and molecular biology are favorably considered. Applicants preferably have majored or minored in one of the following disciplines: genetics, biology (zoology or botany), microbiology, chemistry, mathematics, physics or biophysics. They usually have taken calculus and organic and physical chemistry, although these are not essential. Applicants are accepted to begin their initial studies in the fall. They must apply to the program through a new unified application program known as the Biological and Biomedical Sciences Program (BBSP). Students apply for graduate study in the biological or biomedical sciences at UNC-Chapel Hill. Students interested in any of the BBSP research areas apply to BBSP and those whose application portfolio places them highest on the admission list are asked to visit Chapel Hill for interviews. Students who are ultimately admitted to UNC make no formal commitment to a Ph.D. program. After completing their first year of study students leave BBSP and join a thesis lab and matriculate into one of 12 participating Ph.D. programs. During their first year BBSP students are part of small, interest-based groups led by several faculty members. These groups meet frequently and provide a research community for students until they join a degree granting program. The application consists of Graduate Record Examination (GRE) scores, transcripts of records, three letters of recommendation and a statement of purpose, all submitted through the Web-based application system of The Graduate School. Those whose application portfolio places them highest on the admission list are asked to visit Chapel Hill for interviews. Students are encouraged to apply as early as possible, preferably before January 1. (Applicants seeking a master's degree are not considered for admission.)

Requirements for the Ph.D. Degree

In addition to the dissertation requirements of The Graduate School (four full semesters of credit including at least six hours of doctoral dissertation; a written preliminary examination, an oral examination and a dissertation), students in the Curriculum in Genetics and Molecular Biology must meet the following requirements: complete four didactic courses (three of which are required: GNET 621, GNET 631, GNET 641 and one selected from the following: GNET 632, GNET 622, GNET 624 and one bioinformatics module), one seminar course in which at least one-third of the final grade is based upon class participation, act as a teaching assistant for one semester; participate in a student seminar series as an attendee in the first and second years and as a presenter in the later years, participate in the curriculum's retreat and attend the weekly seminar series sponsored by the curriculum and the Carolina Center for Genome Sciences. Students are required to rotate through at least three laboratories before choosing a thesis advisor. It is strongly recommended that students attend national meetings in order to better understand how their research fits with progress in their field.

Financial Aid

Stipends for predoctoral students are available from an NIH predoctoral training grant and from the University. Tuition, student fees and graduate student health insurance are also covered by the training grant and the University.

Courses for Graduates and Advanced Undergraduates

425 [122] HUMAN GENETICS (BIOL 425) (3). Prerequisite, BIOL 202. Pedigree analysis, inheritance of complex traits, DNA damage and repair, human genome organization, DNA fingerprinting, the genes of hereditary diseases, chromosomal aberrations, cancer and oncogenes, immunogenetics and tissue transplants. Three lecture hours a week. Spring. Maroni.

505 [105] MOLECULAR BIOLOGY (BIOC 505) (3). Prerequisite, BIOC 100 or equivalent. Mechanisms of replication, transcription and translation of genetic material in prokaryotic and eukaryotic systems; gene sequence and organization; biochemical genetics; and regulatory mechanisms. Three lecture hours a week. Fall. Crews, Van Dyke, Xiong, Marzluff.

621 [112] PRINCIPLES OF GENETIC ANALYSIS 1 (BIOL 621) (3). Prerequisite for undergraduates, BIOL 202; for graduate students, an undergraduate genetics course or permission of the instructor. This course covers basic genetic principles and how genetic analyses are used to address basic questions regarding the structure and function of cells and organisms. Fall. Duronio.

622 [113] PRINCIPLES OF GENETIC ANALYSIS IN MAMMALS (BIOL 622). (4). Prerequisite, GNET 621. This course emphasizes genetic processes that are unique to mammals and that are relevant to human health. Spring. Pardo-Manuel de Villena.

624 [160] DEVELOPMENTAL GENETICS (BIOL 624) (3). Prerequisites, BIOL 202 and 205, and permission of the instructor required for undergraduates. Genetic and molecular control of plant and animal development. Extensive reading from primary literature. Fall. Bautch, Reed.

631 [110] ADVANCED MOLECULAR BIOLOGY I (BIOC 631, MCRO 631, PHCO 631, BIOL 631) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. DNA structure, function and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours a week. Fall. Griffith, Ramsden, A. Sancar.

632 [111] ADVANCED MOLECULAR BIOLOGY II (BIOC 632, MCRO 632, PHCO 632, BIOL 632) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. The purpose of this course is to provide historical, basic and current information about the flow and regulation of genetic information from DNA to RNA in a variety of biological systems. Three lecture hours a week. Spring. Baldwin, Strahl, Marzluff.

635 [125] CLINICAL AND COUNSELING ASPECTS OF HUMAN GENETICS (BIOL 529) (3). Prerequisites, BIOL 425 or GNET 634 and permission of the instructor. Topics in clinical genetics including pedigree analysis, counseling/ethical issues, genetic testing, screening and issues in human research. Taught in a small group format. Active student participation is expected. Spring. Roche.

636 [150] ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE (BIOS 550) (4). Prerequisite, integral calculus. Fundamentals of probability theory; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. Three lecture hours a week. Fall. Biostatistics staff.

641 BIOINFORMATICS: A PRACTICAL INTRODUCTION (4). This course provides and introduction to basic genome informatics, including genome databases, sequence analysis, gene expression analysis, protein structural analysis and managing the scientific literature.

Courses for Graduates

623 [161] DEVELOPMENTAL GENETICS SEMINAR (1). Prerequisite, permission of the instructor. Presentations of current research or relevant papers from the literature on development by students will be followed by open forum discussion of relevant points, and critique of presentation skills. Two hours per week. Fall and spring. Bautch.

625 [270] SEMINAR IN GENETICS (BIOL 625) (2). Prerequisite, permission of the instructor. Two seminar hours per week. Fall and spring. Bautch, Maroni, Petes, Peifer, Pukkila, Searles, Sekelsky.

641 BIOINFORMATICS: A PRACTICAL INTRODUCTION (4). This course provides and introduction to basic genome informatics, including genome databases, sequence analysis, gene expression analysis, protein structural analysis and managing the scientific literature.

680 [280] MODELING HUMAN DISEASES IN MICE (1). Prerequisite, permission of the instructor. This course will provide an overview of the use of the mouse as an experimental model for determining factors, both genetic and environmental, that contribute to human diseases. One seminar hour a week. Spring. Koller.

701/702 [201/202] GENETIC LECTURE SERIES (1). Open to genetics students only. Diverse but current topics in all aspects of genetics. Relates new techniques and current research of notables in the field of genetics. Fall and spring. Staff and invited guest lecturers.

703 [275] GENETICS SYSTEMS (BIOL 822) (1). Required of all candidates for the degree in genetics. A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based on their individual dissertation projects. Lectures are privately critiqued by fellow students and genetics faculty. Fall and spring. Genetics staff.

850 [350] TRAINING IN GENETIC TEACHING (3). Prerequisites, two courses in genetics and permission of the instructor. Principles of genetic pedagogy. Students are responsible for assistance in teaching genetics and work under the supervision of the faculty, with whom they have regular discussion of methods, content and evaluation of performance. (Throughout the year.) Staff.

905 [305] RESEARCH IN GENETICS (BIOL 921) (Var.). May be continued for credit two or more semesters. Hours and credits to be arranged. (Throughout the year.) Genetics staff.

993 [393] MASTER'S THESIS (3 or more). (Special permission required.) Students are not accepted directly into the M.S. program. (Throughout the year.) Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall, spring and summer. Staff.

Department of Geography

www.unc.edu/depts/geog

JOHN PICKLES, *Chair*

Professors

Lawrence E. Band (21) Voit Gilmore Distinguished Professor. Geographic Information Systems (GIS), Hydroecology, Geomorphology

Stephen S. Birdsall (5) Cultural Landscapes, North America

Melinda S. Meade (10) Medical Geography, Population, and Southeast Asia

John Pickles (26) Earl N. Phillips Distinguished Chair of International Studies. International Studies, Regional Development, Geographic Thought, Political Economy

Peter J. Robinson (9) Climatology, Climatic Impacts, Hydroclimatology

Stephen J. Walsh (12) Remote Sensing, Geographic Information Systems (GIS), Physical

Associate Professors

Altha J. Cravey (17) Latin America, Social

Martin Doyle (27) Hydro-Ecology, Geomorphology, and Environmental Policy

Michael Emch (29) Medical Geography, Spatial Epidemiology, Health and Environment, Geographic Information Systems (GIS), Remote Sensing

John W. Florin (8) Population, Medical, Historical Anglo-America

Charles E. Konrad (16) Synoptic Climatology and Meteorology
Scott L. Kirsch (23) Historical and Political Geography; Science, Technology and Environment
Aaron Moody (18) Geographic Information Systems (GIS), Biogeography
Conghe Song (24) GIS, Remote Sensing, Earth Systems Science
Wendy Wolford (25) Latin America, Social Movements

Assistant Professors

Banu Gökariksel (28) Urban, Cultural, and Feminist Geography; Social Theory; Globalization and Modernity; the Middle East and Southeast Asia
Nina Martin (31) Urban, Economic and Migration Geography, Globalization and Urban Change, Urban Planning and Policy, Civil Society
Jason Moore (30) Political Ecology, Environmental History, Economic Geography
Gabriela Valdivia (32) Political Ecology, Indigenous Communities, Latin America (Effective July 1, 2009)

Adjunct Faculty

Richard Bilsborrow (Biostatistics), Demography, Development and the Environment, Environment and Society, Research Methods
Ryan Boyles (North Carolina State University), Climate Services, Local and Regional Climatology, Weather and Climate Applications, Observational Sensors and Systems, Data Management
David Easterling (National Climatic Data Center), Climate, Modeling, Observed Climate Variability and Change
Barbara Entwisle (Sociology), Demography, Social Change, GIS and Geographical Approaches in Population Studies
Arturo Escobar (Anthropology), Ecological Anthropology, Social Movements, Political Ecology, Latin America, Complexity
Lawrence Grossberg (Communications Studies), Cultural Studies, Modern and Contemporary Philosophy, Popular Music (Rock Culture) and Popular Culture, Contemporary Political Culture of the United States
Kenneth Hillis (Communication Studies), Place, Space and Landscape, Virtual Geographies, Space and Social and Political Identities
Kevin Hewison (Carolina Asia Center), Globalization and Social Change in Southeast Asia
James H. Johnson Jr. (Kenan-Flagler Business School), Urban and Metropolitan Competitiveness, Business Demographics, Sustainable Economic and Community Development
Jeffrey Lutz (U.S. Department of State) Health, Data Management, Climatology
Carlos Mena (Universidad San Francisco de Quito, Ecuador) GIS, Latin America, Population Environment, Remote Sensing, Dynamic Modeling
Ronald Rindfuss (Sociology), Population and Environment, Family, Fertility
Michael J. Welsh (Family Health International), Health/Population and Development, HIV/AIDS Prevention Programs, Reproductive Health Service Delivery and Evaluation Research, Diffusion of Innovation

Research Professor

Stephen Guptill (United States Geological Survey, retired), GIS, Spatial Analysis, Remote Sensing, Health

Professors Emeriti

David G. Basile
Clyde E. Browning
John D. Eyre
Wilbert M. Gesler
Richard J. Kopec
Thomas M. Whitmore

The Department of Geography offers advanced work leading to the master of arts and doctor of philosophy degrees. Both the M.A. and Ph.D. degrees are offered, but the major emphasis of the program is on the Ph.D., even for those not yet possessing an M.A. Incoming students are roughly evenly mixed between those with and without a master's degree.

The Department of Geography has faculty strength in five overlapping areas of concentration. These represent areas of active faculty research and coherent foci—not mutually exclusive territories. Indeed, many students and faculty work on projects that span more than one area. So, while intensive training is offered in a number of diverse areas, the program is noted for its integrative and cross-cutting approach. The department's diverse graduate students are pursuing a wide variety of research at UNC-Chapel Hill.

Departmental research specializations include:

Biophysical Geography and Earth Systems Science. Here the biophysical environment is examined as an integrated system emphasizing the linkages and feedbacks between terrestrial and atmospheric form and function. The focus is on the interactions between the structure and composition of the earth's surface, its soils and vegetation, and the atmosphere with those processes that actively cycle energy and material through them.

Geographic Information and Analysis. Here geographic information sciences are applied as an integrated set of spatial digital technologies including tools, techniques, concepts and data sets associated with geographic information systems, remote sensing, data visualization, global positioning systems, spatial analysis and quantitative methods.

Nature-Society Studies and Human-Environment Interactions. Drawing on analytical and theoretical perspectives from ecology, sociocultural processes and values, political ecology, science studies and cultural ecology, UNC-Chapel Hill geographers focus on geographies of environmental change, the political-economic and social contexts of environmental change, human uses of the environment and the consequences of such uses.

Social Spaces. Here UNC-Chapel Hill geographers examine cultural geographies of people, places, regions, landscape and resources, space, identity and representation; social geographies of race, space, gender, urban and community dynamics, rural landscapes and regional change, health, migration, inequality and social movements; economic geographies of agrarian and industrial change, science, technology and regional change, post-socialism, political economy, and globalization and international development; and political geography, geopolitics and political ecology.

Globalization and International Development. Here UNC-Chapel Hill geographers study the consequences of the processes of globalization (and the anti-globalization and global justice movements they have stimulated) that are reshaping the geographies of international and local capital, labor, technology, information, goods and services, and the post-war Fordist geographies of economic, social and political life in the United States and globally.

Graduate students in the department participate in most departmental governance activities and maintain their own organization, the Graduate Association of Geography Students (GAGS). UNC-Chapel Hill professional and graduate students also have an active campus-wide organization. Graduate students have access to extensive research and computing facilities within the department and across campus, and many of our students are involved in specialized departmental research groups. Students and faculty have strong ties to other departments and research centers at UNC-Chapel Hill, including the Carolina Population Center, the Odum Institute for Research in Social Science, the Institute of Latin American Studies (UNC-Chapel Hill and Duke University), the Sheps Center for Health Services Research, the Curriculum in Ecology, the Center for Urban and Regional Studies, the Carolina Environmental Program and UNC-Chapel Hill's schools of public

health and medicine. There are also opportunities for course work and research associated with nearby Duke University and North Carolina State University. Many students also take advantage of the government and private research facilities in Research Triangle Park.

Incoming graduate students are required to complete three core courses (GEOG 702 ,703 and 704) presenting the foundations of geographical theory, communication and research. Thereafter the program of study is flexible and tailored to the needs of the individual student. Students select the appropriate course work and dissertation topic in consultation with their advisor and research committee.

A large proportion of graduate students receive financial assistance. Sources of aid include teaching assistantships and work on sponsored research projects within the department, University-wide competitive assistantships, nonservice fellowships and merit scholarships, and externally awarded fellowships.

The department occupies the top two floors of newly renovated Saunders Hall and maintains the extensive computational laboratories needed to fulfill its research and teaching mission, with specialized facilities dedicated to spatial analysis and the use of geographic information systems. A wide range of geographic data sets are readily available. An extensive collection of geographic books and periodicals, including an exceptionally strong collection of foreign periodicals, is held in the nearby Davis Library, while Wilson Library houses a large map library.

Courses for Graduates and Advanced Undergraduates

404 ATMOSPHERIC PROCESSES II (ENST 406) (4). Principles of analysis of the atmosphere are applied to the analysis of environmental phenomena. The link between the atmosphere and other environmental compartments is explored through environmental case studies. Robinson, Konrad.

410 [110] MODELING OF ENVIRONMENTAL SCIENCES (3). Prerequisite, GEOG 110 or equivalent. Use of systems theory and computer modeling to understand general issues in climate, vegetation, geomorphology, soils and hydrology such as crossing time and space scales and linear and dynamical systems. No laboratory. (GISci). Staff.

412 [112] SYNOPTIC METEOROLOGY (3). Prerequisite, GEOG 110 or 111. An analysis of synoptic weather patterns and the processes responsible for them. Climatological aspects of these weather patterns are emphasized. (EES). Konrad, Robinson.

414 [114] PHYSICAL CLIMATOLOGY (3). The factors causing climates and their spatial variation are considered. Particular attention is paid to climate models and to the nature, causes and impacts of climate change. No laboratory. (EES). Konrad, Robinson.

416 [116] APPLIED CLIMATOLOGY (3). Prerequisite, GEOG 412 or 414. An investigation of the ways climatic information and techniques can be applied to societal problems, such as energy production, food production and health. (EES). Konrad, Robinson.

419 [119] FIELD METHODS IN PHYSICAL GEOGRAPHY (3). Involves evaluation of landscapes by examining nature and biophysical elements influencing landscape form and function. Course emphasizes data collection, analysis and interpretation using GIS and field methods. (EES). Doyle, staff.

420 [120] FUNDAMENTAL CONCEPTS OF HUMAN GEOGRAPHY (3). A systematic study of the approaches, key concepts and methods of human geography. Emphasizes the cultural landscape and location analysis within a thematic rather than a regional framework. (Core). Florin.

423 [123] SOCIAL GEOGRAPHY (3). A study of the spatial components of current social problems, such as poverty, race relations, environmental deterioration and pollution, and crime. (GHA). Cravey, staff.

428 [128] URBAN GEOGRAPHY (3). A geographical study of the spatial structure and function of urban settlements. Emphasis is on the regional relations of cities and central place theory. (GHA). Staff.

434 [134] CULTURAL ECOLOGY OF AGRICULTURE, URBANIZATION, AND DISEASE (3). Examines the role of the interactions of cultures, environments and human diseases in the quest for sustainable agriculture by examining the cultural ecology of agriculture systems and their human diseases. (GHA). Meade.

435 [135] ENVIRONMENTAL POLITICS (3). This course brings geographical perspectives on place, space, scale and environmental change to the study of environmental politics. In lectures, texts and student research, students examine topics including environmental health risks, globalization and urban environments, and the role of science in environmental politics. (GHA). Kirsch.

440 [140] EARTH SURFACE PROCESSES (GEOL 502) (3). Prerequisite, GEOG 101 or 110. This course will focus on the processes of soil formation, erosion and landform evolution with an emphasis on the interaction of geomorphic processes with surface hydrology and ecosystems. (EES). Band.

441 [141] INTRODUCTION TO WATERSHED SYSTEMS (3). Prerequisite, GEOG 110. Introduction to the hydrologic and geomorphic processes and forms in watersheds as applied to problems in flood analysis, water quality and interactions with ecosystem processes. Course will cover the structure of drainage networks, nested catchments and distribution and controls of precipitation, evaporation, runoff, soil and groundwater flow. (EES). Band.

442 [142] RIVER PROCESSES (3). Introduction to landforms and processes associated with flowing water at the earth's surface. Hydrology, sedimentology and theories of channel formation and drainage basin evolution. (ESS). Doyle.

444 [144] LANDSCAPE BIOGEOGRAPHY (3). This course is concerned with the application of biogeographical principles and techniques to the study of natural and human-modified landscapes. It includes local and extraregional case studies. (EES). Moody.

445 [145] MEDICAL GEOGRAPHY (3). The human ecology of health is studied by analyzing the cultural/environmental interactions that lie behind world patterns of disease distribution, diffusion and treatment, and the ways these are being altered by development. (GHA). Meade.

446 [146] GEOGRAPHY OF HEALTH CARE DELIVERY (3). This course covers basics, including personnel and facility distributions, accessibility, regionalization and location/allocation modeling; spatial analysis and GIS; and the cultural geography of health care, including humanist and political-economic perspectives. (GHA). Staff.

447 [147] GENDER, SPACE AND PLACE IN THE MIDDLE EAST (ASIA 447, INTS 447) (3). Examines gender, space and place relationships in the modern Middle East. Investigates shifting gender geographies of colonialism, nationalism, modernization and globalization in this region. Gökariksel.

448 [148] TRANSNATIONAL GEOGRAPHIES OF MUSLIM SOCIETIES (INTS 448) (3). Examines modern Muslim geographies that are created by transnational flows, connections and imaginaries that cross national and regional boundaries across the Middle East, Southeast Asia and beyond. Gökariksel.

450 [150] POPULATION GEOGRAPHY (3). A study of the spatial dimensions of population growth, density and movement and of the shifts in these patterns as they relate to changes in selected socioeconomic and cultural phenomena. (GHA). Florin, Meade, Whitmore.

452 [152] MOBILE GEOGRAPHIES: THE POLITICAL ECONOMY OF MIGRATION (3). This course explores the contemporary experience of migrants. Various theoretical approaches are introduced, with the emphasis on a political-economic approach. (GHA). Cravey.

453 [153] POLITICAL GEOGRAPHY (PWAD 453) (3). The geography of politics is explored at the global, the nation-state and the local scale in separate course units, but the interconnections between these geographical scales are emphasized throughout. (GHA). Cravey, Kirsch.

454 [154] HISTORICAL GEOGRAPHY OF THE UNITED STATES (FOLK 454) (3). A study of selected past geographies of the United States with emphasis on the significant geographic changes in population, cultural and economic conditions through time. (GHA). Florin.

457 [157] RURAL LATIN AMERICA: AGRICULTURE, ENVIRONMENT AND NATURAL RESOURCES (3). Prerequisite, GEOG 259 or permission of the instructor. This course explores a systems and cultural-ecological view of agriculture, environment, natural resource and rural development issues in Latin America. It serves as a complement to GEOG 458, Urban Latin America. (Regional). Whitmore.

458 [158] URBAN LATIN AMERICA: POLITICS, ECONOMY AND SOCIETY (3). Prerequisite, GEOG 259 or permission of the instructor. This course examines urban social issues in contemporary Latin America. Cities and their residents will be considered in relation to each other and to North American examples. (Regional). Cravey.

460 [160] GEOGRAPHIES OF ECONOMIC CHANGE (3). This course is designed to explore changing geographies of production and consumption in theory and in practice. Wolford.

464 [164] EUROPE TODAY: TRANSNATIONALISM, GLOBALISMS AND THE GEOGRAPHIES OF PAN-EUROPE (INTS 464) (3). A survey by topic and country of Europe west of Russia. Those features that make Europe a distinct and important region today are emphasized. (Regional). Pickles.

477 [177] INTRODUCTION TO REMOTE SENSING AND DIGITAL IMAGE PROCESSING (3). Prerequisite, GEOG 370 or equivalent. Emphasizes methods of data analysis that offer an automated approach to spatial and nonspatial data synthesis, which combines a system of data capture, storage, management, retrieval, analysis and display. (GISci). Fall. Moody, Song, Walsh.

491 [191] INTRODUCTION TO GIS (PLAN 491) (3). Prerequisite, GEOG 370 or equivalent. Stresses the spatial analysis and modeling capabilities of organizing data within a geographic information system. (GISci). Fall. Moody, Song, Walsh.

577 [178] ADVANCED REMOTE SENSING (3). Prerequisite, GEOG 370, 477 or equivalent. Acquisition, processing and analysis of satellite digital data for the mapping and characterization of land cover types. (GISci). Moody, Song, Walsh.

591 [192] APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (PLAN 591) (3). Prerequisite, GEOG 370, 491 or equivalent. Applied issues in the use of geographic information systems in terrain analysis, medical geography, biophysical analysis and population geography. (GISci). Walsh, Moody, staff.

593 [193] GEOGRAPHIC INFORMATION SCIENCE PROGRAMMING (3). Prerequisite, GEOG 370 or 491. This course will teach students the elements of GISci software development using major GIS platforms. Students will modularly build a series of applications through the term, culminating in an integrated GIS applications program. Band, Walsh, Song, Liang.

594 [194] GLOBAL POSITIONING SYSTEMS AND APPLICATIONS (3). Prerequisite, GEOG 370. Global Positioning Systems (GPS) fundamental theory, application design, post processing, integration of GPS data into GIS and GPS application examples (such as public health, business, etc.) will be introduced. Band, Liang, staff.

595 [195] ECOLOGICAL MODELING (3). Prerequisites, STOR 355 (or BIOL 561) or equivalents with the permission of the instructor. This course focuses on modeling the terrestrial forest ecosystems processes, including population dynamics, energy, water, nutrients and carbon flow through the ecosystem. (GISci). Song.

Courses for Graduates

702 [202] CONTEMPORARY GEOGRAPHIC THOUGHT (3). History and philosophy of the geographic discipline, with particular emphasis on developments in recent decades. Kirsch.

703 [203] GEOGRAPHIC RESEARCH DESIGN (3). Introduction to the theory and practice of geographic research. The range of methods available for problem identification and solution are considered through development of specific research proposals. Staff.

704 [204] COMMUNICATING GEOGRAPHY (1). This informal seminar introduces new students to departmental faculty and resources outside the department. Whitmore.

705 [205] ADVANCED QUANTITATIVE METHODS IN GEOGRAPHY (3). Application of selected multivariate statistical techniques to the analysis of geographic phenomena and problems. Moody, Konrad.

710 [210] ADVANCED PHYSICAL GEOGRAPHY—BIOGEOSCIENCE (3). Examination of the major processes controlling environmental cycling of material and energy at the landscape level, and development of a quantitative understanding of the physical and ecosystem processes responsible for landscape pattern and evolution. Staff.

711 [211] ADVANCED PHYSICAL GEOGRAPHY—HYDROCLIMATOLOGY AND BIOCLIMATOLOGY (3). Examination of topics focused on the atmospheric and the vegetation and land surface parts of the hydrologic cycle at the micro to global spatial scale and short-term to millennial temporal scale. Band, Doyle.

715 [215] LAND USE/LAND COVER DYAMICS AND HUMAN-ENVIRONMENT INTERACTION (3). Examination of topics that integrate social, natural and spatial sciences within the context of human-environment interactions, with an emphasis on landuse/landcover dynamics and spatial digital technologies for linking landscape form and function. Walsh.

720 [220] CULTURAL AND POLITICAL ECOLOGY (3). This course examines the foundations and current literature on cultural and political ecology. Focus is given to the appropriation of "Nature", degradation and deforestation, conservation, famine, postcolonial peasants, resistance, Indigeneit, and property, land distribution and governmentality. Wolford.

760 [260] GEOGRAPHIES OF ECONOMIC CHANGE (3). This course is designed to explore changing geographies of production and consumption in theory and practice. Wolford.

790 [290] SPATIAL ANALYSIS AND COMPUTER MODELING (3). This course introduces students to spatial analysis techniques involving points, lines, areas, surfaces, and nonmetric spaces, as well as programming basic geographic models on microcomputers. Staff.

Seminars for Graduates

801 [301] RESEARCH SEMINAR IN EARTH SYSTEM SCIENCE AND BIOPHYSICAL GEOGRAPHY (3). An in-depth seminar devoted to contemporary faculty research topics in earth system science and biophysical geography. Topics and instructors vary. Staff.

802 [302] RESEARCH SEMINAR IN GEOGRAPHIC INFORMATION SCIENCES (3). An in-depth seminar devoted to contemporary faculty research topics in geographic information sciences. Topics and instructors vary. Staff.

803 [303] RESEARCH SEMINAR IN NATURE-SOCIETY STUDIES AND HUMAN-ENVIRONMENT INTERACTIONS (3). An in-depth seminar devoted to contemporary faculty research topics in nature-society studies and human-environment interactions. Topics and instructors vary. Staff.

804 [304] RESEARCH SEMINAR IN SOCIAL GEOGRAPHY (3). An in-depth seminar devoted to contemporary faculty research topics in social geography. Topics and instructors vary. Staff.

805 [305] RESEARCH SEMINAR IN INTERNATIONAL AREA STUDIES, DEVELOPMENT AND GLOBALIZATION (3). An in-depth seminar devoted to contemporary faculty research topics in international area studies, development and globalization. Topics and instructors vary. Staff.

811 [311] SEMINAR/READINGS IN EARTH SYSTEM SCIENCE AND BIOPHYSICAL GEOGRAPHY (3). An in-depth seminar devoted to contemporary readings in earth system science and biophysical geography. Topics and instructors vary. Staff.

812 [312] SEMINAR/READINGS IN GEOGRAPHIC INFORMATION SCIENCES (3). An in-depth seminar devoted to contemporary readings in geographic information sciences. Topics and instructors vary. Staff.

813 [313] SEMINAR/READINGS IN NATURE-SOCIETY STUDIES AND HUMAN-ENVIRONMENT INTERACTIONS (3). An in-depth seminar devoted to contemporary readings in nature-society studies and human-environment interactions. Topics and instructors vary. Staff.

814 [314] SEMINAR/READINGS IN SOCIAL GEOGRAPHY (3). An in-depth seminar devoted to contemporary readings in social geography. Topics and instructors vary. Staff.

815 [315] SEMINAR/READINGS IN INTERNATIONAL AREA STUDIES, DEVELOPMENT AND GLOBALIZATION (3). An in-depth seminar devoted to contemporary readings in international area studies, development and globalization. Topics and instructors vary. Staff.

Special Work, Theses and Dissertations

900 [299] SPECIAL WORK IN GEOGRAPHY (1–21). Prerequisites, two courses in the one hundred bracket, or permission of the instructor. (On demand.) Staff.

993 [393] MASTER'S THESIS (3–6). Fall or spring. Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3–9). Fall and spring. Members of the graduate faculty.

Department of Geological Sciences

www.geosci.unc.edu
LARRY K. BENNINGER, *Chair*

Professors
John M. Bane Jr. (024) Physical Oceanography
Larry K. Benninger (017) Low-Temperature Geochemistry
Joseph G. Carter (015) Paleoecology, Invertebrate Paleontology
Allen F. Glazner (020) Igneous Petrology, Tectonics
Jonathan M. Lees (037) Seismology, Geophysical Inverse Theory
Christopher S. Martens (007) Chemical Oceanography
Jose A. Rial (026) Geophysics, Seismology

Associate Professors
Louis R. Bartek (036) Sedimentology, Stratigraphy, Marine Geology
Drew S. Coleman (038) Isotope Geochemistry, Geochronology
Kevin G. Stewart (027) Structural Geology
Donna M. Surge (041) Paleoclimate, Paleoecology, Low-Temperature Geochemistry

Assistant Professors
Stephen R. Meyers (042) Paleoclimate, Sedimentary Geochemistry, Stratigraphy, Geostatistics
Lara Wagner (043) Seismology, Tectonics

Adjunct Appointments
Alan E. Boudreau, Petrology, Geochemistry
Brian Coffey, Carbonate Sedimentology, Petroleum Geology
Dennis LaPoint, Economic Geology
Antonio Rodriguez, Coastal Geology, Sedimentology

Professors Emeriti
John M. Dennison
A. Conrad Neumann
John J. W. Rogers
Joseph St. Jean Jr.
Daniel A. Textoris

The Department of Geological Sciences offers programs leading to the M.S. and Ph.D. degrees in geological sciences. A broad background is offered in most major areas of geoscience, with particular emphasis on isotope geochemistry, geochronology, seismology, volcanology, igneous petrology, marine geology, low-temperature geochemistry, paleoclimatology, paleoceanography, paleontology, paleoecology, sequence stratigraphy, structural geology and tectonics.

Admission and General Degree Requirements

Students admitted to pursue a graduate degree in the Department of Geological Sciences normally are expected to have an undergraduate degree in traditional geology, geochemistry, geophysics, biology, chemistry, mathematics, physics or other related interdisciplinary fields. All applicants must take the Graduate Record Examination (GRE). All foreign students whose native language is not English also must take the Test of English as a Foreign Language (TOEFL) examination.

Course requirements for incoming students will be determined by individual graduate committees, often in consultation with the director of graduate studies. Specific requirements are varied to meet the needs and career objectives of the individual.

Master of Science

Requirements for the master of science degree are 30 semester hours (six of which may be credit for thesis), a written comprehensive examination taken after most of the course work has been completed, a thesis and a final oral examination in defense of the thesis.

Doctor of Philosophy

Normally a student must have completed a master's degree before being admitted to the doctoral program. A student may be permitted to bypass the master's degree after one year of residence upon demonstration of superior scholastic performance and research potential, recommendation of his or her graduate committee and approval by the geological sciences faculty.

Admission to the Ph.D. program after completing the M.S. degree in the Department of Geological Sciences requires faculty approval.

Requirements for the Ph.D. degree are a minimum of 45 semester hours of graduate credit (which may include 30 hours from the M.S. degree) plus a minimum of six hours of credit for the dissertation, a written comprehensive examination and an oral comprehensive examination, a dissertation and a final oral examination in defense of the dissertation.

Facilities and Research Interests

The Department of Geological Sciences occupies the 50,000 square feet of floor space in Elisha Mitchell Hall, and houses a departmental library which contains more than 47,000 volumes as well as periodicals, maps and electronic resources in the geosciences.

Research equipment and facilities include a thermal ionization mass spectrometer; two Class 100 clean labs; direct current plasma spectrometer; scanning electron microscope; counting laboratory (alpha-, beta- and gamma-emitting radionuclides); benzene 14C laboratory; gas chromatograph- isotope ratio mass spectrometer (in Marine Sciences);

Avaatech X-Ray Flourescence Core Scanner: UIC Inc. Carbon Analyzer (Carbon Dioxide Coulometer, Acidification Module, Horizontal Furnace); ICP mass spectrometer and electron microprobe (at Duke University); chirp sonar and side-scan sonar imaging systems; Landmark Graphics Geological Interpretation System; seismic reflection system; grain-size analysis equipment; core x-radiograph; microsampling system with epifluorescence capabilities. The department utilizes a variety of computing resources, including networked Windows, Macintosh, LINUX and UNIX workstations. Campus-wide supercomputer clusters are available through the North Carolina Supercomputing Center. UNC-Chapel Hill and Duke University jointly operate the R/V Cape Hatteras, a part of the UNOLS oceanographic research fleet, which is docked at the Duke Marine Lab in Beaufort, North Carolina.

Financial Aid

Approximately 17 graduate and teaching assistantships with stipends of $14,700–$15,700 per academic year (2008–2009 stipends) are available to graduate students. In addition, all graduate students in good standing receive a summer research fellowship ($6,250–$7,000 in 2008–2009) from a departmental endowment.

The department nominates one or two students to be considered by The Graduate School for nonservice fellowships; no additional application is necessary. Faculty research grants support some research assistantships. Out-of-state students are recommended for remission of out-of-state tuition costs; all students are recommended for an in-state tuition award. Most students are eligible for both, and therefore are responsible only for the payment of student fees.

Courses for Graduates and Advanced Undergraduates

401 [58] STRUCTURAL GEOLOGY (4). Prerequisite, one of the following introductory courses: GEOL 101, 105, 109 or 111. Introduction to the mechanical behavior and dynamic evolution of the Earth's crust through the study of deformed rocks. Includes weekend field trip to western North Carolina. Staff.

402 [57] SEDIMENTOLOGY AND STRATIGRAPHY (4). Prerequisites GEOL 101, or 111, or equivalent; and GEOL 301. Introduction of principles involved in description and classification of sedimentary rocks and stratigraphic units as well as stratigraphic correlation. Students will be introduced to relationships of processes, depositional environments and sedimentary facies. Staff.

403 [101] OCEANOGRAPHY (BIOL 350, ENVR 417, MASC 401) (3). Prerequisite, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record and the history of oceanography. Term paper. Intended for students with college science background; other students should consider GEOL 103. Three lecture hours a week. Fall, spring. Staff.

404 [053] IGNEOUS AND METAMORPHIC PETROLOGY (4). Prerequisite, GEOL 301 or permission of the instructor. Studies of the origin and evolution of igneous and metamorphic rocks, including microscopic, x-ray and field methods; volcanology; plate-tectonic interpretation of rock sequences. Three lecture and three laboratory hours a week.

410 [111] EARTH PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 410, MASC 410) (4). Prerequisites, CHEM 102, GEOL 111 or 213, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of geological and related Earth systems sciences are applied to the analysis of environmental phenomena. The link between the lithosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one laboratory hour a week. (On demand.) Benninger, Band.

411 [112] OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 411, MASC 411) (4). Prerequisites, BIOL 101, CHEM 102, ENST 222, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of analysis of the ocean, coast, and estuarine environments and the processes that control these environments are applied to the analysis of environmental phenomena. The link between the hydrosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one laboratory hour a week. Fall. Staff.

413 PALEONTOLOGY (4). Prerequisites, GEOL 101, 109, 111, or 159; 402 or 478; or permission of the instructor. A field-oriented course on larger Ordovician through Pliocene fossil invertebrates in the central and eastern United States. Students develop a personal reference collection of more than 250 genera and species, along with data of stratigraphy and biostratigraphy. Three lecture and two laboratory hours a week. Fall or spring. (Alternate years) Carter.

415 [116] ENVIRONMENTAL SYSTEMS MODELING (ENST 415, ENVR 461, MASC 415) (3). Prerequisites, MATH 383, PHYS 105 or 117 (may be taken concurrently), or permission of the instructor. Methods for developing explanatory and predictive models of environmental processes are explored. Includes discussion of the relevant scientific modes of analysis, mathematical methods, computational issues and visualization techniques. Two lecture hours and one computer laboratory hour a week. Spring. Rial, Werner.

417 [138] GEOMORPHOLOGY (ENST 417) (3). Prerequisites, GEOL 101 or 111, and MATH 231, or permission of the instructor. Introduction to process geomorphology with emphasis on quantitative interpretation of weathering, hill slope, fluvial, glacial and eolian processes from topography and landscapes. Fall. (Alternate years.) Staff.

417L [138L] GEOMORPHOLOGY LABORATORY (1). Pre- or corequisite, GEOL 417. Two laboratory hours per week.

421 [102] ARCHAEOLOGICAL GEOLOGY (ANTH 421) (3). Permission of the instructor. The application of geological principles and techniques to the solution of archaeological problems. Geological processes and deposits pertinent to archaeological sites, geologic framework of archaeology in the southeastern United States and techniques of archaeological geology and site analysis are studied. Field trips to three or more sites are conducted; written reports on geological aspects of the sites required. (On demand.) Staff.

422 [122] PHYSICS OF THE EARTH'S INTERIOR (PHYS 422) (3). Prerequisites, MATH 383, PHYS 201 or 301, and PHYS 311. Origin of the solar system: the nebular hypothesis. Evolution of the Earth and its acretionary history. Earthquakes, plate tectonics and the interior of the Earth. The Earth's magnetic field. Mantle convection.

430 [125] COASTAL SEDIMENTARY ENVIRONMENTS (MASC 430) (3). Prerequisite, GEOL 402. Introduction to modern shallow-water clastic environments and their sediments, emphasizing barrier islands, deltas, estuaries, wetlands and tidal flats. Includes local field trips and discussion/application of data-collecting techniques. Fall. Staff.

431 [133] MICROPALEONTOLOGY (MASC 431) (4). Prerequisite, GEOL 478, MASC 440 or permission of the instructor. An in-depth study of the biostratigraphy, paleoecology and taxonomy of various microfossil groups (i.e., foraminifera, ostracodes, conodonts, coccoliths, radiolaria, diatoms, acritarchs, dinoflagellates, etc.) dependent upon individual student objectives. Three lecture and three laboratory hours a week.

432 [134] PALEOCLIMATOLOGY (3). Prerequisite, GEOL 402 or permission of the instructor. Introduction to mechanisms that drive climate. Examination of past climate reconstructions using ecological and geochemical proxies. Utility of computer models to reconstruct past climates and predict future climate change. Emphasis placed on late Quaternary. Fall. (Alternate years). Surge, Meyers.

433 [117] PALEOCEANOGRAPHY (3). Prerequisites, GEOL 402, 503 or permission of the instructor. Origin and distribution of pelagic sediments. Review of the major Mesozoic and Cenozoic events in the world oceans. Glacial/interglacial changes in the ocean/atmosphere system. Spring (alternate years), fall. Meyers, Surge.

434 [123] MARINE CARBONATE ENVIRONMENTS (4). Prerequisite, permission of the instructor. Chemical and biological origins of calcium carbonate, skeletal structure and chemo-mineralogy, preservation, sedimentation and early diagenesis are studied in a variety of deep and shallow environmental settings to understand skeletal genesis, limestone origin and carbonate facies variability. Field trip to Florida, Bahamas or Bermuda. Laboratory exercises; research report. Spring. (Alternate years.) Staff.

436 [130] TOPICS IN EARTH AND ENVIRONMENTAL SCIENCES (3). Key topics and resources for high school teachers preparing to teach earth and environmental sciences. Includes lithosphere, tectonic processes, hydrosphere, atmosphere, origin of solar system and life, and environmental stewardship. Spring, summer. Staff.

440 [113] PRINCIPLES OF SEISMOLOGY (3). Prerequisites, GEOL 101, 213, 401; MATH 231; or permission of the instructor. Descriptive account of global seismology, earthquake distribution and focal mechanics. Principles of geometrical optics and applications to imaging the Earth's interior. Principles of seismic prospecting of hydrocarbon and geothermal reservoirs.

450 [115] BIOGEOCHEMICAL PROCESSES (ENST 450, ENVR 415, MASC 450) (4). Prerequisites, CHEM 251 or 261, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of chemistry, biology and geology are applied to analysis of the fate and transport of materials in environmental systems, with an emphasis on those materials that form the most significant cycles. The course examines these processes in systems that contain the hydrosphere, lithosphere, atmosphere and biosphere. Three lecture hours and one laboratory hour a week. Fall. Staff.

456 [157] PROBLEMS IN VERTEBRATE EVOLUTION (BIOL 456) (3). Prerequisite, BIOL 276 or permission of the instructor. A study of the major transitions in vertebrate evolution and associated problems in evolutionary biology, structural change, paleoecology, biogeography and earth history, physiology and behavior.

478 [419] INVERTEBRATE PALEONTOLOGY (BIOL 478) (4). Prerequisite, GEOL 159 or BIOL 101, or permission of the instructor. Introduction to the principles, methods of analysis, and major controversies within paleontology. Examination of the fossil record and its application to problems in evolutionary biology, paleoecology, paleoclimatology and general Earth history. Spring (alternate years), fall. Carter, Surge.

480 [141] MODELING OF MARINE AND EARTH SYSTEMS (ENVR 480, MASC 480) (1–3). Prerequisite, MATH 232 or permission of the instructor. Mathematical modeling of the dynamic system, linear and nonlinear. The fundamental budget equation. Case studies in modeling convective transport, biogeochemical process, population dynamics. Analytical and numerical techniques, chaos theory, fractal geometry. Spring. Werner, Rial.

483 [119] GEOLOGIC AND OCEANOGRAPHIC APPLICATIONS OF GEOGRAPHICAL INFORMATION SYSTEMS (MASC 483) (4). Prerequisites, four GEOL courses or permission of the instructor. Focus is on applying GIS concepts and techniques to mining and petroleum geology, resource assessment, hydrogeology, coastal and marine geology, physical oceanography, engineering geology and a geologic perspective on land use. Three lecture and two laboratory hours a week. Spring. Staff.

501 [118] GEOLOGICAL RESEARCH TECHNIQUES (2). Permission of the instructor. An introduction to methods of obtaining, analyzing and presenting geologic and paleontologic data. Fall or spring. Staff.

502 [147] EARTH SURFACE PROCESSES (GEOG 440) (3). Prerequisite, GEOG 101 or 110. See GEOG 440 for description. Band.

503 [188] GEOLOGICAL OCEANOGRAPHY (MASC 503) (4). Prerequisite, GEOL 101, 111 or permission of the instructor. Ocean basin origin, continental margin development, coastal geology, carbonate platforms and pelagic sediments are subjects covered; paleooceanographic reconstructions are emphasized. Three lecture and two laboratory hours a week. Spring. Staff.

504 [173] TOPICS IN PETROLOGY (4). Prerequisite, GEOL 404. Origin of magmas and evolution of igneous and metamorphic rocks, combined with petrographic study of selected sites and individual examples. Two lecture and six laboratory hours a week. Spring. Glazner.

505 [105] CHEMICAL OCEANOGRAPHY (ENVR 505, MASC 505) (4). Prerequisite, one semester of physical chemistry or CHEM 480, or permission of the instructor. Overview of chemical processes in the ocean. Topics include physical chemistry of seawater, major element cycles, hydrothermal vents, geochemical tracers, air-sea gas exchange, particle transport, sedimentary processes and marine organic geochemistry. Three lecture and two recitation hours a week. Spring. Martens, Arnosti, Alperin.

506 [106] PHYSICAL OCEANOGRAPHY (MASC 506) (4). Prerequisites, MATH 231, 232; PHYS 104, 105; or permission of the instructor. Descriptive regional oceanography, equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation, modern observations, waves, tides. Three lecture and two recitation hours a week. Fall. Bane.

507 RHYTHMS IN GLOBAL CLIMATE AND THE STRATIGRAPHIC RECORD (3). Prerequisite, GEOL 402. An overview of the mechanisms of cyclic climate forcing and a review of the geologic evidence for these climate rhythms, with a particular emphasis on the Milankovitch orbital cycles.

508 [163] APPLIED HYDROLOGY (3). Prerequisites, GEOL 101 or 111, MATH 231, PHYS 105, or permission of the instructor. An introduction to methodologies and instrumentation for quantifying the movement of water in the earth system focusing on components of the hydrologic cycle. Emphasis is divided between analytical aspects and field procedures. (On demand.) Staff.

509 [165] GROUNDWATER (3). Prerequisites, GEOL 101, 105, 109 or 111; CHEM 102; MATH 231; PHYS 104, 116; or permission of the instructor. Introduction to physics, chemistry and geology of groundwater. Fall. (Alternate years.) Benninger.

510 [164] GEOCHEMISTRY OF NATURAL WATERS (3). Prerequisites, CHEM 102; GEOL 101, 105, 109 or 111; MATH 231; or permission of the instructor. Survey of processes affecting the compositions of streams, lakes, the ocean and shallow ground waters. Spring. (Alternate years.) Benninger.

511 [166] STABLE ISOTOPES IN THE ENVIRONMENT (ENST 511) (3). Prerequisite, CHEM 102. Introduction to the theory, methods and applications of stable isotopes to environmental problems. Primary focus will be on the origin, natural abundance and fractionation of carbon, hydrogen, oxygen and nitrogen isotopes. Fall. (Alternate years.) Surge.

512 [145] GEOCHEMISTRY (MASC 553) (3). Prerequisites, CHEM 102, GEOL 101 or 111, or permission of the instructor. Introduction to the application of chemical principles to geological problems, with emphasis on isotope methods. Spring. (Alternate years.) Benninger.

514 [139] RIVER SYSTEMS OF EAST COAST NORTH AMERICA (3). Prerequisites, GEOL 101 or 111; 211 or 417; at least junior status. Analysis of 23 rivers from St. Lawrence to the Everglades, from headwaters to oceanic terminus of turbidite fan. Focus on stream processes, geologic development, hydrology, utilization history, ecology and planning.

515 [142] INTRODUCTION TO GEOPHYSICS (3). Prerequisites, PHYS 104 and 105. Introduction to the fundamentals of global geophysics: gravity, seismology, magnetism, heat and plate tectonics. Both shallow and deep processes are considered. Emphasis is aimed at problem solving by applying concepts. Fall. (Alternate years.) Lees, Rial.

516 [120] ENVIRONMENTAL FIELD MAPPING AND INFORMATION SYSTEMS (3). Prerequisite, GEOL 401. Field and laboratory methods for collection, assimilation, and manipulation of map-based earth science data within a geospatial relational database. Introduction to applications of remote sensing and analysis of digital topography. Spring. Staff .

517 [136] SEQUENCE AND SEISMIC STRATIGRAPHY (3). Prerequisite, GEOL 402. Examination of lithostratigraphic principles and the sequence

stratigraphic paradigm. Students will study use of variation of well log signature reflection attributes and reflection termination patterns to identify and correlate sequences and systems and to interpret the lithology and depositional history of subsurface stratigraphic units. Fall. Bartek.

518 [151] GEODYNAMICS (3). Prerequisites, CHEM 102; GEOL 101 or 111; MATH 232; PHYS 104, 105. Interior of the Earth deduced from seismology, gravity, heat flow, magnetism; geophysics of continents and ocean basins; age of Earth. Spring. (Alternate years.) Staff.

519 [150] HISTORY OF THE EARTH (3). Prerequisites, GEOL 101, 105, 109 or 111; plus 301, 401, 402 and 404; or permission of the instructor. History of the Earth's surficial and internal systems, including biologic evolution; development of oceans, atmosphere, and climate; plate tectonic processes; evolution of crust and mantle. Fall. (Alternate years.) Staff.

520 [152] DATA ANALYSIS IN THE EARTH SCIENCES (3). Prerequisites, an introductory geology course numbered below 202, except first-year seminar; MATH 231 and 232; or permission of the instructor. Introduction to quantitative analysis in earth sciences: solid earth, atmospheres, oceans, geochemistry and paleontology. Topics covered: univariate and multivariate statistics, testing, nonparametric methods, time series, spatial and cluster analysis, shapes. Spring. Lees.

522 [154] PHYSICAL VOLCANOLOGY (3). Prerequisites, introductory courses in geology and physics. Course is aimed at understanding the physical properties and processes controlling volcanism and magma transport. Topics covered include volcanic processes from the formation of magma in the upper mantle to violent eruption at the surface. Emphasis is placed on dynamic processes and underlying mechanisms.

550 [140] BIOGEOCHEMICAL CYCLING (MASC 550) (3). Prerequisites, ENVR 421; GEOL 510, 512, 655; MASC 440, 505; or permission of the instructor. Biogeochemical cycling explores interfaces of marine, aquatic, atmospheric and geological sciences emphasizing processes controlling chemical distributions in sediments, fresh and salt water, the atmosphere and fluxes among these reservoirs. Spring. Martens, Alperin, Arnosti.

552 [144] ORGANIC GEOCHEMISTRY (ENVR 552, MASC 552) (3). Prerequisites, CHEM 261 and MASC 505, or permission of the instructor. Sources, transformations and fate of natural organic matter in marine environments. Emphasis on interplay of chemical, biological and physical processes that affect organic matter composition, distribution and turnover. Fall. (Alternate years). Arnosti.

555 [197] PALEOBOTANY (BIOL 555) (4). Prerequisites, BIOL 101/101L and permission of the instructor. An introduction to the morphology, stratigraphic occurrence and evolutionary relationships of fossil plants. Both macrofossils and microfossils will be considered. Three lecture and three laboratory hours a week. Spring (Alternate years). Gensel.

560 [181] FLUID DYNAMICS (ENVR 452, MASC 560, PHYS 660) (3). Prerequisite, PHYS 301 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Three lecture hours a week. Fall. Shay.

563 [143] DESCRIPTIVE PHYSICAL OCEANOGRAPHY (MASC 563) (3). Prerequisite, MASC 506 or permission of the instructor. Observed structure of the large-scale and mesoscale ocean circulation and its variability, based on modern observations. In situ and remote sensing techniques, hydrographic structure, circulation patterns, ocean-atmosphere interactions. Spring. (Alternate years.) Bane.

590 SPECIAL TOPICS EARTH SCIENCE (3).

601 [128] SUMMER FIELD COURSE IN GEOLOGY (3). Prerequisites, GEOL 301, 401, 402 and 404. Six-week field camp conducted in New Mexico, Arizona and Colorado. Field interpretation of rocks and their deformation; construction of geologic maps; introduction to hydrology. Includes field trips to classic localities such as the Grand Canyon. First summer session only. Staff.

602 [129] SUMMER FIELD COURSE IN GEOLOGY (3). Prerequisites, GEOL 301, 401, 402 and 404. Six-week field camp conducted in New Mexico, Arizona and Colorado. Field interpretation of rocks and their deformation; construction of geologic maps; introduction to hydrology. Includes field trips to classic localities such as the Grand Canyon.

608 [182] CONTINUUM MECHANICS IN THE EARTH SCIENCES (ENST 608) (3). Prerequisites, introductory geology course numbered below GEOL 202, except first-year seminar; MATH 231; PHYS 104 or 116; or permission of the instructor. Applications of continuum mechanics in the earth sciences, including stress, strain, elasticity and viscous flow. Numerical solutions to problems in heterogeneous finite strain including finite element analysis. Spring. (Alternate years.) Stewart.

609 [184] ADVANCED FIELD SEMINAR IN GEOLOGY (1–4). Prerequisites, GEOL 601 and 602 or equivalent. A field course that emphasizes advanced field methods. Emphasis is placed on large-scale, detailed field work in complex structural terrains and on independent mapping that will lead to thesis/dissertation and/or publication. (On demand.) Glazner, Coleman, Stewart, Oskin.

655 [146] PHYSICAL GEOCHEMISTRY (3). Prerequisites, CHEM 102 and MATH 232, or permission of the instructor. An introduction to physical geochemistry and chemical thermodynamics with special emphasis on geological applications. Three lecture hours a week. (On demand.) Benninger.

Courses for Graduates

700 [300] RESEARCH SEMINAR (1). Required of all entering graduate students or permission of the chair. A topical seminar in current research topics in the earth sciences. Presentations by selected faculty with an emphasis on in-depth, critical analysis of current research literature. Two hours a week. Fall. Staff.

701 [301] SEMINAR (0.5–21). (Offered as needed.) Staff.

703 [202] SEDIMENTARY GEOLOGY I (3). Prerequisites, GEOL 402 or equivalent, or permission of the instructor. Stratigraphic, sedimentologic, geochemical, petrologic and paleontologic principles will be summarized. Emphasis is placed on both the techniques used in sedimentary geology and on the characteristics and processes that distinguish sedimentary environments. (On demand.) Fall. Staff.

704 [203] SEDIMENTARY GEOLOGY II (3). Prerequisite, GEOL 703. Continuation of GEOL 703. Spring. Staff.

705 [204] ADVANCED PETROLOGY I (3). Prerequisites, CHEM 102, MATH 233, PHYS 105, GEOL 404. Application of thermodynamics, phase equilibria, thermobarometry, radiogenic and stable isotope geology, and geochemical modeling to the study of igneous and metamorphic rocks and crustal evolution. Fall. Glazner, Coleman.

706 [205] ADVANCED PETROLOGY II (3). Prerequisite, GEOL 705. Continuation of GEOL 705. Spring. Glazner, Coleman.

707 [214] STRATIGRAPHIC MICROPALEONOTOLOGY: MESOZOIC CALCAREOUS NANNOFOSSILS (4).

709 [225] CLASTIC DEPOSITIONAL SYSTEMS: PROCESSES AND PRODUCTS (3). Prerequisite, GEOL 402. Examination of the use of lateral and vertical changes in sedimentary facies to identify depositional processes and environments of deposition within the terrestrial, marginal marine, shelf and deep sea clastic depositional systems. These systems will be examined in a sequence stratigraphic framework. Spring. Bartek.

711 [246] ADVANCED MINERALOGY (3).

712 [257] ISOTOPE GEOCHEMISTRY (3). Prerequisites, GEOL 301, 404, 402 and CHEM 102. Survey of isotopic studies in geology; geochronology, crustal evolution, heat flow, paleotemperatures, origin of ore deposits. Spring (Alternate years). Coleman.

804 [264] ADVANCED IGNEOUS PETROLOGY (4).

805 [266] IGNEOUS GEOCHEMISTRY (4).

806 [265] METAMORPHIC PETROLOGY (4).

807 [279] PHYSICS OF EARTHQUAKES (3). Prerequisites, MATH 524, PHYS 211 or permission of the instructor. The earthquake source. Description. Moment tensor. Developments in the mathematical theory of seismic sources. Radiation patterns. Earthquake mechanisms and plate tectonics. Synthetic seismograms. Seismicity and self-organized criticality. (On demand.) Rial.

809 [280] TECTONOPHYSICS (3). Prerequisites, MATH 83, PHYS 201, 211 or permission of the instructor. Fundamental physical processes necessary for an understanding of plate tectonics; stress and strain in solids; elasticity and flexure; heat transfer; gravity; mantle rheology and convection. Fall. (Alternate years.) Lees, Rial.

851 [302] SEMINAR IN STRATIGRAPHY (0.5–21). Offered as needed. Staff.

852 [306] SEMINAR IN PALEOECOLOGY (0.5–21). Offered as needed. Staff.

853 [310] SEMINAR IN PALEONTOLOGY (0.5–21). Offered as needed. Staff.

854 [318] SEMINAR IN CONTINENTAL MARGINS (0.5–21). Offered as needed. Staff.

855 [320] SEMINAR IN SEDIMENTOLOGY (0.5–21). Offered as needed. Staff.

856 [357] SEMINAR IN ISOTOPE GEOLOGY (0.5–21). Offered as needed. Staff.

857 [345] SEMINAR IN GEOCHEMISTRY (0.5–21). Offered as needed. Staff.

858 [360] SEMINAR IN PETROLOGY (1–21). Offered as needed. Staff.

859 [372] SEMINAR IN ECONOMIC GEOLOGY (0.5–21). Offered as needed. Staff.

860 [376] SEMINAR IN VOLCANOLOGY (3). All aspects of volcanism will be covered including seismology, geochemistry, deep structure, volcanic products and hazards. Readings of original papers will be stressed. Spring. Lees.

861 [380] SEMINAR IN GEOPHYSICS (0.5–21). Offered as needed. Rial.

862 [381] SEMINAR IN SEISMOLOGY (1–21). Offered as needed. Rial.

863 [382] SEMINAR IN STRUCTURAL GEOLOGY (0.5–21). Offered as needed. Stewart.

864 [383] SEMINAR IN TECTONICS (1–21). Offered as needed. Staff.

Research Courses

900 [392] RESEARCH IN GEOLOGY (3–6).

992 [393] MASTER'S THESIS (3–6).

994 [394] DOCTORAL DISSERTATION (3–9).

Department of Germanic Languages and Literatures

www.unc.edu/depts/german
CLAYTON KOELB, *Chair*

Professors

Jonathan Hess (3) 18th-Century Studies, German-Jewish Cultural History, Aesthetics and Literary Theory, Philosophy and Literature
Clayton Koelb (4) Modern Literature (Thomas Mann, Franz Kafka), Literary Theory, Philosophy and Aesthetics, Comparative Literature
David Pike (8) 20th-Century Literature, East German and Soviet Culture and Politics
Paul T. Roberge (9) Historical Linguistics, Older Germanic Dialects, Comparative Germanic Grammar, Pidgins and Creoles, Afrikaans, Language, Ethnicity, and Politics

Associate Professors

Richard Langston (6) Postwar and Contemporary Literature, Avant-Garde Studies, Popular Culture and Literature, Literary and Cultural Theory
Kathryn Starkey (10) Medieval Literature, Visuality and Textuality, Gender and Sexuality, Historical Linguistics, Older Germanic Dialects

Assistant Professor

Anna Parkinson (18) 20th- and 21st-Century Literature and Culture, Psychoanalysis, Feminist and Queer Theory, Critical Theory, Film Studies, Minority Literature and Culture

Lecturer

Christina Wegel (11) Drama and Theater, Theater Productions and Music in the Foreign Language Classroom, Contemporary Literature

Associated Faculty

Helga Bister (2) Dialectology, Contact and Sociolinguistics, Applied Linguistics
Dan Thornton (17) Postwar German and Austrian Literature, Expressionism, Neue Sachlichkeit, Golden Age and 20th-Century Dutch Literature, Holocaust Studies, Jewish Literature in the Diaspora

Professors Emeriti

Walter K. Francke
Richard H. Lawson
Siegfried Mews
Christoph E. Schweitzer
Sidney R. Smith
Petrus W. Tax

The Department of Germanic Languages and Literatures offers graduate programs leading to the degrees of master of arts and doctor of philosophy. Students concentrate in either German Literature and Culture, or Germanic Linguistics.

PLEASE NOTE: At this time the department is accepting applications for the German Literature and Culture program only.

The faculty welcomes and encourages the pursuit of interdisciplinary interests, and students regularly take courses offered by other academic units in the University (e.g., the Curriculum of Comparative Literature, the Program in Cultural Studies, and the departments of History, Linguistics and Communication Studies). Students regularly take advantage of courses taught in literary and cultural theory in other departments, and the faculty also encourages students to take courses at nearby Duke University. Within the broad requirements of The Graduate School and the department, every effort is made to meet the student's individual needs. The department ordinarily expects at least one year of teaching experience as part of the graduate program, and provides rigorous training in German language teaching methodology (GERM 700).

Prospective students should examine the document, "Guide to Graduate Studies in German," which describes departmental curricula and requirements in detail. It is available on the Web at www.unc.edu/depts/german.

Master of Arts in Germanic Languages

Admission: Applicants normally should have completed an undergraduate degree with a major in German or a related field.

Requirements: The M.A. degree is designed to be completed in four semesters. A minimum of 30 semester hours (typically ten courses) is required, and must include GERM 700 and 993 (M.A. thesis credit),

as well as GERM 501 (Structure of German) and GERM 502 (Middle High German). Either 501 or 502 will be offered every year, on a rotating basis. (In special circumstances, where scheduling makes it difficult for both of these courses to be taken in the M.A. curriculum, students may, in consultation with the director of graduate studies, either substitute another course for 501 or 502 or take either 501 or 502 during the first year of Ph.D. coursework.) Ordinarily it is expected that M.A. students will write a minimum of three substantial course papers during the first year.

Students concentrating in German literature and culture are also required to take GERM 615 and 616 and a comprehensive M.A. examination, ordinarily at the beginning of the fourth semester. The reading list for the examination should consist of a list of at least 25 titles, compiled by the student in consultation with his/her advisor, and representing all the major periods and genres of German literature. The 25 titles may include as many works from the GERM 615–616 reading lists as the student and advisor deem suitable. The GERM 615–616 syllabi are included in the "Guide to Graduate Studies in German."

Courses numbered at the 400 level may count toward the M.A. degree only with special approval of the director of graduate studies.

The M.A. thesis is based on the respective student's research and should be approximately 45 pages in length; the final version of the thesis needs to be formally approved by the student's advisor and the two committee members and is due no later than the last day of classes of the fourth semester.

Doctor of Philosophy in Germanic Languages

Admission: Applicants normally should have completed a master's degree in German or the equivalent. Only those students who have demonstrated academic excellence at the M.A. level will be admitted to the Ph.D. program.

Requirements: The Ph.D. requires a total of 24 semester hours beyond those required for the M.A. This typically amounts to six courses beyond the M.A. degree (if received from UNC-Chapel Hill) and six hours of dissertation credit (GERM 994). For the most part, Ph.D. students pursue individualized programs of study.

Students concentrating in German literature and culture elect courses in consultation with their advisor so as to gain exposure to different periods (medieval, early modern, 18th, 19th, and 20th centuries) and to a variety of critical approaches to the study of literature and culture. Ph.D. students are expected to enroll in no fewer than four courses (beyond those required for the M.A.) for which a substantial term paper is required.

Courses numbered at the 400 level may count toward the Ph.D. degree only with special approval of the director of graduate studies.

Students who have earned M.A. degrees at other institutions should consult with the director of graduate studies regarding the transfer of credit. Students from other institutions take GERM 700 during their first year of teaching at UNC-Chapel Hill.

Ph.D. students must demonstrate reading knowledge of one foreign language (other than German) deemed relevant to a particular course of study. This is usually French, but students may petition the department to substitute another language. Students normally take the Ph.D. examination at the end of the second year of doctoral studies. The Ph.D. examination allows students to investigate areas of particular interest (from which a dissertation topic will emerge), while it observes The Graduate School's requirement of comprehensiveness.

To be admitted to candidacy for the degree of doctor of philosophy, students must have completed all course work, fulfilled the foreign language requirement, passed the PhD examination, and developed a satisfactory dissertation prospectus. All students must write an acceptable dissertation based on independent research.

Financial Aid

The department nominates outstanding students for competitive nonservice fellowships awarded by The Graduate School. In order to be fully considered for these competitive fellowships, applicants should ensure that all application materials arrive by January 1. A varying number of teaching assistantships are awarded annually to qualified graduate students. Duties involve teaching German at the elementary or intermediate level, or leading recitations (in English or in German) for large undergraduate lecture courses on German literature, culture and philosophy. The department recommends those receiving assistantships for special tuition awards, including remission of out-of-state tuition. To receive priority consideration for such departmental financial aid, applications must be received by January 31.

The duration of financial aid is usually two years at the master's level and three to four years at the doctoral level. However, reappointment and continuation of support depend critically on satisfactory academic progress and performance of duties (where applicable).

Graduate students are also encouraged to apply for external fellowships (e.g., Fulbright, DAAD) that will enable them to spend a year in residence at a German university. The Graduate School offers dissertation fellowships on a competitive basis to support dissertation research both on- and off-campus.

UNC–Tübingen Graduate Exchange Program

Each year, the department selects one graduate student to go to Tübingen, Germany, to take part in an educational and teaching exchange program. A graduate student from Tübingen spends the year studying at UNC-Chapel Hill, teaching in the German department, and living in the UNC German House as a resource person.

Library and Research Facilities

The University library has outstanding holdings in German literature, Germanic linguistics, literary theory and general linguistics, with further materials available from nearby Duke University (especially valuable for the Jantz Collection of Baroque Literature and German–Americana). A good collection of basic reference works and standard editions is available to students in the department reading room. The language laboratory has not only instructional tapes but also much other recorded material, such as German plays, songs and dialect recordings.

Literature and Culture Courses for Graduates and Advanced Undergraduates

**Courses numbered 620-689 may be taken for three credit hours (final examination required) or students may concurrently enroll in GERM 705 for one additional credit hour. The four-credit-hour option requires a term paper and is available to German department graduate students only.*

615 [111] HISTORY OF GERMAN LITERATURE I (3). Prerequisites, GERM 301, 302 and 303, or equivalent and permission of the instructor. First part of a two-semester sequence offering students a comprehensive, text-based survey of German literary history from the High Middle Ages to the present.

616 [112] HISTORY OF GERMAN LITERATURE II (3). Prerequisites, GERM 301, 302 and 303, or equivalent and permission of the instructor. Second part of a two-semester sequence offering students a comprehensive, text-based survey of German literary history from the High Middle Ages to the present.

***625 [115] EARLY MODERN LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. German literature of the 15th, 16th and 17th centuries. Close readings, lectures and discussions of representative texts.

***630 [120] 18TH-CENTURY LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. Literature in the Age of Enlightenment. Close readings, lectures and discussions of representative texts.

***640 [125] EARLY 19TH-CENTURY LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. Literature of the Romantic period. Close readings, lectures and discussions of representative texts.

***645 [130] LATER 19TH-CENTURY LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. Literature of Realism, Naturalism and related movements. Close readings, lectures and discussions of representative texts.

***650 [135] EARLY 20TH-CENTURY LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. Major figures of the period from the turn of the century to World War II. Close readings, lectures and discussions of representative texts.

***655 [140] LATER 20TH-CENTURY LITERATURE** (3). Prerequisites, GERM 301, 302 and 303, or equivalent (if taught in German) and permission of the instructor. Literature since World War II in both the Federal Republic and the former GDR. Close readings, lectures and discussions of representative texts.

685 EARLY 21ST-CENTURY GERMAN LITERATURE (3). Literature since German unification in 1989. Close readings, lectures and discussions of representative texts.

Courses for Graduates

700 [205] FOREIGN LANGUAGE PEDAGOGY: THEORIES AND PRACTICE (3). For prospective teachers of German. Required of all teaching assistants. Fall.

703 [206] ADVANCED TOPICS IN FOREIGN LANGUAGE PEDAGOGY (3). Prerequisite, GERM 700. This seminar provides experienced teaching assistants the opportunity to revisit the fundamentals in foreign language pedagogy while exploring in greater depth advanced issues like content-based instruction, technology and supervising.

705 [115E] ESSAY COURSE (1). Corequisite, a German Department course numbered 620–689. Courses numbered 620–689 may be taken in conjunction with GERM 705 for one additional credit hour. Requires a term paper. Available to German Department graduate students only.

820 [210] TOPICS IN MEDIEVAL LITERATURE (3).

825 [215] TOPICS IN EARLY MODERN LITERATURE (3).

830 [220] TOPICS IN 18TH-CENTURY LITERATURE (3).

840 [225] TOPICS IN EARLY 19TH-CENTURY LITERATURE (3).

845 [230] TOPICS IN LATER 19TH-CENTURY LITERATURE (3).

850 [235] TOPICS IN EARLY 20TH-CENTURY LITERATURE (3).

855 [240] TOPICS IN LATER 20TH-CENTURY LITERATURE (3).

860 [250] TOPICS IN AESTHETICS AND CRITICISM (3).

865 [245] TOPICS IN GERMAN CULTURAL STUDIES (3).

870 [246] TOPICS IN GENDER STUDIES (3).

875 [247] TOPICS IN GERMAN JEWISH STUDIES (3).

880 [248] TOPICS IN GERMAN CINEMA (3).

896 [299] INDEPENDENT READINGS (Var.). Prerequisite, permission of the instructor and the director of graduate studies. Special readings and research in a selected field or topic outside the scope of current course offerings.

980 [345] SEMINAR IN GERMAN LITERATURE (3).

985 [361] SEMINAR IN GERMANIC LINGUISTICS (3).

993 [393] MASTER'S THESIS (Var.).

994 [394] DOCTORAL DISSERTATION (Var.).

Courses in Dutch for Graduates and Advanced Undergraduates

402 [105] ELEMENTARY DUTCH (3). Rapid introduction to modern Dutch with emphasis on all fundamental components of communication.

403 [106] INTERMEDIATE DUTCH (3). Prerequisite, DTCH 402 or equivalent. Focuses on increased skills in speaking, listening, reading, global comprehension and communication. Emphasis on reading and discussion of longer texts.

404 [107] ADVANCED INTERMEDIATE DUTCH (3). Prerequisite, DTCH 403 or equivalent. Aims to increase proficiency in language skills (reading, speaking, writing) and is constructed around a series of themes meant to introduce students to Dutch society, culture, and history.

405 TOPICS IN DUTCH CULTURE: A LITERARY SURVEY (3). Prerequisites, DTCH 404 or equivalent, ability to read and speak Dutch at intermediate to advanced level. Introduction to Dutch literature from Middle Ages to the present. Survey of topics in Dutch culture.

Courses in Norwegian for Graduates and Advanced Undergraduates

402 [181] ELEMENTARY NORWEGIAN (3). Rapid introduction to modern Norwegian with emphasis on all fundamental components of communication.

404 [182] INTERMEDIATE NORWEGIAN (3). Prerequisite, NORW 402 or equivalent. Focuses on increased skills in speaking, listening, reading, global comprehension and communication. Emphasis on reading and discussion of longer texts.

School of Government

www.sog.unc.edu
MICHAEL R. SMITH, *Dean*

Albert Coates Professor of Public Law and Government
David N. Ammons, Public Administration
James C. Drennan, Courts Law and Judicial Administration

Gladys Hall Coates Professor of Public Law and Government
Janet Mason, Social Services Law
David W. Owens, Environmental and Land Use Law
Robert P. Joyce, Education Law

William R. Kenan Jr. Professor
David M. Lawrence, Local Government Law

Professors
A. Fleming Bell II, Local Government Law
Frayda S. Bluestein, Local Government Law, Associate Dean for Programs
Molly Broad, Professor of the Practice
Joan G. Brannon, Courts Law and Judicial Administration (retired)
John Michael Crowell, Public Law and Government
Robert L. Farb, Criminal Law and Procedure (retired)
Joseph S. Ferrell, Property Tax Law, Secretary of the Faculty
Milton S. Heath Jr., Environmental Law

Cheryl D. Howell, Judicial Education and Administration
Laurie L. Mesibov, Education Law
John Rubin, Criminal Law and Procedure
John L. Saxon, Social Services Law
Michael R. Smith, Dean
Carl W. Stenberg III, Public Administration
Thomas H. Thornburg, Criminal Law, Senior Associate Dean
A. John Vogt, Governmental Finance and Accounting (retired)
Richard B. Whisnant, Environmental Law
Gordon P. Whitaker, Public Administration

Albert and Gladys Hall Coates Term Associate Professor for Outstanding Faculty Achievement
William C. Rivenbark, Public Administration

Albert and Gladys Hall Coates Term Associate Professor for Teaching Excellence
Jessica Smith, Criminal Law and Procedure

Associate Professors
Maureen M. Berner, Public Administration
Mark F. Botts, Mental Health Law
Richard D. Ducker, Land Use Law
Diane Juffras, Employment Law
Jill D. Moore, Public Health Law John B. Stephens, Inter-Agency and Public Policy Dispute Resolution
Charles Szypszak, Real Estate Law

Assistant Professors
Ann Anderson
Shea R. Denning, Property Tax Law
Willow S. Jacobson, Human Resource Management
James Markham, Criminal Law
Kara Millonzi, Local Government and Finance
Jonathan Q. Morgan, Economic Development
Ricardo S. Morse, Public Administration
Christopher Tyler Mulligan, Community and Economic Development
Karl Smith, Tax Law
Aimee N. Wall, Public Health Law
Jeff Welty, Criminal Law
Eileen Youens, Public Contract law

Senior Lecturer
Gregory S. Allison, Governmental Accounting and Financial Reporting

Lecturers
Norma Houston, Public Law and Government
Joseph E. Hunt, Property Tax Appraisal and Assessment Administration
Kenneth L. Joyner, Property Tax Administration
Dona Lewandowski, Public Law and Government
Dale Roenigk, Performance Measurement, Public Administration
Shannon Schelin, Director, Center of Public Technology
Vaughn Upshaw, Public Governance

Adjunct Faculty
Lydian Altman-Sauer, Public Intersection Project
Phillip Boyle, School Boards and Public Management
Margaret Carlson, Public Governance
Margaret Henderson, Nonprofit Management
W. Calvin Horton, Local Government Management
Richard Stevens, State Government
William Thornton, Local Government Law

The School of Government (www.sog.unc.edu) has its roots in the Institute of Government, established at UNC-Chapel Hill in 1931, and has long focused on state and local government in the broader study of government, public law, public finance and public administration. Today, it is the nation's leading university-based provider of instructional and advisory services to state and local government practitioners. Through Institute of Government instructional programs, advising, research and publishing, the School of Government advances general understanding about government and shares that information with practitioners and other scholars. The school offers a program of courses leading to the master of public administration (M.P.A.) degree.

Master of Public Administration Degree Program

CARL STENBERG, *Director*

M.P.A. Program Teaching Faculty
Allison; Ammons; Berner; Bluestein; Broad; Henderson; Horton; Michele Hoyman, Department of Political Science; Hughes; Jacobson; Morgan; Morse; Owens; Rivenbark; Roenigk; Saxon; Schelin; Smith; Stenberg; Stephens; Stevens; Szypszak; Vogt; Whisnant; Whitaker; Deil Wright, Department of Political Science.

Program Overview

The School of Government offers the master of public administration (M.P.A.) degree. Rated among the nation's best, the M.P.A. program offers a curriculum that blends the development of practical skills in analysis, communication, finance and management with an overarching emphasis on the enhancement of individual leadership skills.

Accredited by the National Association of Schools of Public Affairs and Administration, the M.P.A. program has produced graduates now serving as officials in local, state and federal government. At the local level, alumni serve as city and county managers, budget and finance directors, personnel directors, other department heads and professional staff. In state governments, alumni direct departments and serve in management and staff positions in policy planning, finance and management, personnel, water resources, health services, education and other areas. At the federal level, alumni serve as administrators and analysts in a variety of agencies, including the Office of Management and Budget, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Labor, the Government Accountability Office, the Administrative Office of the Courts and Senate and House committee staffs. In the nonprofit sector, M.P.A. alumni administer programs in the arts, in education, in economic development and in human services.

More information is available on the Web at www.mpa.unc.edu.

Admission Requirements

The M.P.A. program welcomes individuals from different backgrounds. A majority of past entrants into the program have had undergraduate majors in the social sciences, especially political science and economics, but applicants have been accepted with undergraduate majors in architecture, business administration, engineering, English, , history, industrial relations and many other fields.

The requirements for admission are

- Bachelor's degree
- At least a B average in the undergraduate major and a generally strong academic record
- Minimum of three semester hours credit in American government and politics

- Satisfactory verbal and quantitative scores on the Graduate Record Examination (GRE)
- One-page statement of purpose that indicates student aspirations that are consistent with the focus and strengths of the M.P.A. program
- Three letters of recommendation
- Oral interview with the MPA Admissions Committee

All admissions decisions are made during the spring for fall semester matriculation. Applicants are encouraged to meet the application deadlines of The Graduate School. However, the M.P.A. program continues to accept applications through February 1. After a preliminary screening of applications, notifications are made concerning the required oral interview.

Financial Aid

The M.P.A. program provides financial assistance to many of its students. Research assistantships or partial scholarships are available to top candidates. Furthermore, some students become involved with Institute of Government projects or work with other university, governmental or nonprofit organizations as paid, part-time graduate assistants.

Course Work and Degree Requirements

A minimum of 54 semester hours of credit, an internship and a final oral examination are required for the M.P.A. The two years of study and work are designed to combine three essential components of professional development: 1) a rigorous core of education in the theory and practice of public management, 2) a choice of an in-depth elective specialization in the second year and 3) a summer-long internship between the first and second years, in a position with substantive responsibilities.

Core course requirements are

- Public Organization Theory and Behavior (3)
- Introductory Policy Evaluation Methods (3)
- Professional Communications (3)
- Collaborative Governance (3)
- Public Management and Leadership (3)
- Methods for Policy Analysis and Evaluation (3)
- Human Resources Management (3)
- Government Budgeting and Finance (3)
- Governmental and Not-For-Profit Accounting and Reporting (2)
- Public Policy Analysis (3)
- Ethical and Effective Public Administration (1.5)
- Strategic Information Technology Management (1.5)
- Economics in Public Administration (1.5)
- M.P.A. Professional Development Seminar I and II (2 each)

In addition to the common core, each student completes 16.5 semester hours of elective courses.

Courses

Government (GOVT)

660 [160] MUNICIPAL ADMINISTRATION (4). This course covers municipal government organization and management, finance, personnel, planning and economic development, and the administration of specific municipal functions. Spring. Allison.

661 [161] COUNTY GOVERNMENT (4). This course covers county government organization and management, finance, personnel, planning and economic development, and the administration of specific municipal functions. Spring. Allison.

662 [162] INFORMATION TECHNOLOGY PROJECT MANAGEMENT AND LEADERSHIP (3). Examines the public sector environment as it relates to information technology development. Special attention focused on the complex environment and its influence on information technology based solutions. Fall, spring. Brown.

663 [163] PUBLIC EXECUTIVE LEADERSHIP ACADEMY (6). The Public Executive Leadership Academy is designed for North Carolina city and county managers to understand oneself as a leader and to prepare the organization to work with others in improving the quality of life within the community. Fall. Stenberg.

664 [164] CHIEF INFORMATION OFFICER CERTIFICATION PROGRAM (5). The CIO Certification Program is designed for chief information officers of local governments in North Carolina. The course lays the foundation for addressing the most critical issues facing IT leadership in local government and equips leaders with tools to manage and improve their organizational assets. Fall. Schelin.

Public Administration (PUBA)

710 [210] PUBLIC ORGANIZATION THEORY AND BEHAVIOR (3). Exposition, comparison, and case-based application(s) of basic models of organizations, with emphasis on public sector entities. Fall. Whitaker.

711 [211] PUBLIC MANAGEMENT AND LEADERSHIP (3). Prerequisite, PUBA 710. Development of administrators' skills in working with others to accomplish organization goals. Conceptual and experimental modes of learning used to examine a variety of administrative behaviors. Spring. Whitaker.

719 [212] INTRODUCTORY POLICY EVALUATION METHODS (3). The application of statistical methods to problems of evaluation of public programs and problems facing public managers. Theory and basic techniques up to an introduction of linear regression analysis. Fall. Staff.

720 [237] METHODS FOR POLICY ANALYSIS AND EVALUATION (POLI 725) (3). Prerequisite, PUBA 212, PLAN 130, or equivalent. Introduction to selected techniques such as the following: multiple regression, decision theory, research design, social experiments and quasi-experiments, program evaluation and policy-related models. Spring. Unah.

721 [234] PROFESSIONAL COMMUNICATIONS (3). Grounds students in the fundamental techniques of writing and oral presentation in a range of formats suited to public service. Fall. Bizzell, Williams.

722 [219] POLITICS OF THE ADMINISTRATIVE PROCESS (POLI 219) (3). The motivations of public agency officials, interactions between bureaucracies and other political actors, and alternative strategies to control bureaucratic power and discretion in making, implementing and evaluating public policies. Fall. Hoyman.

723 [226] HUMAN RESOURCE MANAGEMENT (3). Examination of political and institutional environment of public management, the evolution of the United States civil service system, competing values and principles shaping contemporary human resource management, and traditional human resource management functions. Spring. Jacobson.

730 [233] GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING AND REPORTING (2). Teaches the principles of accounting and financial reporting in governmental and not-for-profit environment. Provides skills for analyzing the financial condition of governments and the efficiency and effectiveness of governmental programs. Spring. Allison.

731 [214] GOVERNMENT BUDGETING AND FINANCE (3). An introduction to the revenue and expenditure structure of the public sector including revenue policy, expenditure policy and budget structure and administration. Topics are examined from an applied perspective using analytic criteria from public sector economics, public administration and political science. Spring. Rivenbark.

740 [205] PUBLIC POLICY ANALYSIS (POLI 718) (3). The roles of expertise in policy discourse, the place of values in policy analysis, summarizing preferences, benefits and costs, policy models, policy expertise and democratic political systems. Fall. Whisnant.

742 [235] VALUES AND ETHICAL PERSPECTIVES ON PUBLIC POLICY (1–3). Understanding and clarifying the valuational base of administrative and policy choices. Ethical problems encountered in public officials' personal actions. Spring. Staff.

745 [217] M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR I (2). Integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences and seminars. Fall. Ammons.

746 [218] M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR II (POLI 218) (2). Continued integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences and seminars. Spring. Ammons.

749 [213] ETHIC /EFFECT PUBLIC ADMINISTRATION (POLI 720) (3). Prerequisites, POLI 210, 211, 212, 214, 226. The role(s), function(s) and strategy of public administrators in the formulation, adoption and implementation of public policies. Policy from the perspective of the policy maker; cases exploring the relationship of theories to actual policy processes. Spring. Wright, Stenberg.

751 [225] CITY AND COUNTY MANAGEMENT (3). Nature of city or county manager's job: expectations of elected body, staff, public and professional peers. Examines contemporary issues in departmental operations that have significant effect on how manager's performance is perceived. Fall. Ammons, Horton.

752 [224] PRODUCTIVITY IMPROVEMENT IN LOCAL GOVERNMENT (3). This course will acquaint students with the concept of productivity, its importance in the public sector, principal techniques used to improve productivity in local government and barriers to productivity improvement initiatives. Fall. Ammons.

756 [215] NONPROFIT MANAGEMENT (3). Examination of the managerial challenges posed by nonprofit organizations and of techniques and practices used by managers of nonprofit organizations. Fall. Henderson.

757 [702] FINANCIAL MANAGEMENT OF NONPROFIT ORGANIZATIONS (SOWO 885) (3). This course provides basic financial skills for leaders of nonprofits, including bookkeeping fundamentals, interpreting financial statements, budgeting, cash management and investment, and legal compliance. Fall. Staff.

758 [227] NAVIGATING NONPROFIT-LOCAL GOVERNMENT RELATIONSHIPS (1–3). This course is designed for graduate students who are seeking professional positions in local government or nonprofits. The overall objectives are to exchange information about issues of mutual concern to both nonprofits and governments. Spring. Henderson.

760 [230] LAW FOR PUBLIC ADMINISTRATION (3). An introduction to law for students in public administration or related disciplines. Topics: sources of law and legal resources, personnel law, administrative law and selected topics in constitutional law relevant to public administration. Fall. Bluestein.

761 [216] LOCAL GOVERNMENT LAW (1.5). Overview of key legal concepts affecting local government operations. Topics include relation to federal/state governments, legal structures, finance and regulatory powers, plus introduction to the legal system and analysis. Spring. Bluestein.

762 [223] ADMINISTRATIVE LAW DEVELOPMENT AND APPLICATIONS (3). Addresses legal issues in the exercise of governmental power by federal, state and local agencies in the United States. Topics include legislative and executive oversight, rule making, adjudication and judicial review. Fall. Owens.

765 [222] CAPITAL BUDGETING AND FINANCE (3). Prerequisite, PUBA 214. Analysis of alternative approaches to planning and administering the budgets and financial operations of public agencies. Extensive use of case materials. Fall. Vogt.

768 [221] PUBLIC AFFAIRS DISPUTE RESOLUTION AND CONSENSUS BUILDING (3). Theory and practice of dispute resolution and consensus building processes for public policy and program implementation. Utilizes exercises to develop skills in multi-party conflict analysis, negotiation, and intervention for inter-governmental, nonprofit and community disputes. Spring. Stephens.

770 [220] POLITICS OF COMMUNITY ECONOMIC DEVELOPMENT: STRATEGIES AND CHOICES (POLI 770) (3). This course covers economic development from the community's perspective. The class develops criteria that a community should use in making economic development choices. The course presents a wide range of strategies. Fall. Hoyman.

771 [231] MANAGING ECONOMIC DEVELOPMENT (3). Emphasizes the practical application and implementation of various approaches to economic development. Students will apply tools/strategies by doing case studies and small group projects based on real-world scenarios faced by local practitioners. Fall. Morgan.

775 [228] ELECTRONIC GOVERNMENT: PRACTICES AND METHODOLOGIES (3). This course focuses on the issues involved in administering and managing e-government activities. Special emphasis is placed on the particular challenges endemic to public performance. Fall. Brown.

776 [229] MANAGING INFORMATION TECHNOLOGY IN LOCAL GOVERNMENT AND NONPROFITS (1–3). The course explores information technology policies, development, training, assessment and organizational behavior. Spring. Staff.

778 [238] INTERGOVERNMENTAL RELATIONS (POLI 726) (3). Examines conflict and cooperation among governmental officials representing national, state and local government in the United States; changing roles of governments; and new mechanisms for intergovernmental collaboration. Fall. Wright.

780 [240] SPECIAL TOPICS IN PUBLIC ADMINISTRATION (3). Prerequisite, permission of the instructor. Seminar in selected areas of public administration. Topics will vary from year to year. May be repeated for credit. Fall and spring. Staff.

781 [241] DIRECTED READINGS IN PUBLIC ADMINISTRATION (1–3). Directed readings in a special field under the direction of a member of the graduate faculty. Fall and spring. Staff.

900 [395] RESEARCH IN PUBLIC ADMINISTRATION (POLI 802) (0–6). Fall, spring and summer. Staff.

Department of History

www.unc.edu/depts/history
LLOYD S. KRAMER, *Chair*

Professors

William L. Barney (92) Political History of 19th-Century America
Christopher R. Browning (30) 20th-Century Germany, the Holocaust
W. Fitzhugh Brundage (96) U.S. South since the Civil War, New South
Melissa M. Bullard (38) Renaissance, Mediterranean, and Early Modern Europe
John C. Chasteen (45) 19th-Century Latin America (Especially Brazil), Popular and Political Culture
Peter A. Coclanis (85) U.S. Economic and Business History, Colonial History
William Ferris (65) U.S. South (with Emphasis on Literature), Documentary Studies
W. Miles Fletcher (52) Japanese History
Joseph T. Glatthaar (69) Civil War Era, U.S. History
Karen Hagemann (40) Modern Europe, Gender and Social
Jacquelyn D. Hall (90) U.S. Women's History, Oral History, U.S. South
Barbara J. Harris (24) European Women's History (Especially Early Modern, Tudor-Stuart England)
R. Don Higginbotham (84) Colonial and Revolutionary America
Michael H. Hunt (97) U.S. Diplomatic History, U.S.-East Asian Relations, Chinese Foreign Relations
Konrad H. Jarausch (32) 19th- and 20th-Century Europe
John F. Kasson (88) American Intellectual and Cultural History, Technology and Society, Art and Literature

Richard H. Kohn (82) Military History
Lloyd S. Kramer (39) European Intellectual History
Roger W. Lotchin (81) Urban Political History, 1800 to the Present
Genna Rae McNeil (86) African American History
L. Louise McReynolds (42) 19th-Century Russia
Theda Perdue (95) Native American History
Louis A. Pérez Jr. (46) Latin America, Caribbean, Cuba
Donald J. Raleigh (64) 20th-Century Russian/Soviet History
Donald M. Reid (36) Modern French History
John E. Semonche (77) American Legal and Constitutional History
Jay M. Smith (34) France 1550-1815
Richard A. Soloway (23) 19th-Century Britain: Social, Intellectual and Church History
Richard J. A. Talbert (18) Ancient Rome, Classics
Harry L. Watson (93) North Carolina History

Associate Professors
Daniel V. Botsman (53) Modern Japanese History
Kathryn Burns (47) Colonial Latin American Gender/Women's History
Jerma A. Jackson (96) African American History
Wayne E. Lee (71) Military History, Colonial American History
James L. Leloudis (91) North Carolina History, U.S. South, Education History
Lisa A. Lindsay (80) West Africa; African Diaspora
W. James McCoy (17) Ancient, Particularly Greek History
Terence V. McIntosh (33) Early Modern European History, Economic and Social
Yasmin Saikia (50) South Asia
Sarah D. Shields (55) Islamic Civilization
Michael Tsin (54) Modern Chinese History

Assistant Professors
Chad Bryant (66) 20th-Century Eastern European History
Kathleen DuVal (67) Early America, Early American Women
Crystal N. Feimster (100) 19th- and 20th-Century U.S. History, African American History
Michelle King (59) Modern Chinese History
Christopher J. Lee (58) Colonial and Modern Africa
Fred Naiden (19) Ancient Greece
John Sweet (68) Early American History
Brett E. Whalen (41) Medieval History
Heather Williams (94) 19th-Century U.S. History, African American History

Joint Appointments
Robert C. Allen (73) American Studies
Michael D. Green (74) Native American History
Larry Griffin (70) Social Relations and Historical Sociology
Reginald F. Hildebrand (75) African and African American Studies
I. Peter Kaufman (43) Christian Tradition from Late Antiquity to Reformation

Professors Emeriti
Josef Anderle
Samuel H. Baron
Stephen B. Baxter
Frederick O. Behrends
Judith Bennett
Herbert L. Bodman Jr.
Henry C. Boren
E. Willis Brooks
Peter G. Filene
David Griffiths
John M. Headley
Lawrence D. Kessler
Frank W. Klingberg
William E. Leuchtenburg
Donald G. Mathews
Michael McVaugh
John K. Nelson
William S. Powell
Richard W. Pfaff
Frank W. Ryan Jr.
George V. Taylor
George B. Tindall
Peter F. Walker
Gerhard L. Weinberg
Joel R. Williamson

Graduate students in history develop both depth and breadth of historical knowledge. Each student works primarily within one of nine major fields: ancient history, European history, history of science, history of women, global history, Latin American history, military history, Russian and East European history and United States history. Students who advance to the doctoral level also develop expertise in a second field chosen from an even broader range of possibilities—that is, not only any of the above major fields but also African history, Middle Eastern history and Asian history.

Extensive information about the graduate program in history is available at www.unc.edu/depts/history/grad, and the regulations that guide students' progress can be seen at www.unc.edu/depts/history/grad/regs.html. Please use these to supplement the brief summary below.

Admission

The department considers applications from those holding undergraduate degrees and those who have obtained M.A. degrees elsewhere. Students admitted to the department with an M.A. from another university will be reviewed by the faculty at the time of entry into the program to determine whether they should take second M.A. degrees here or proceed directly to Ph.D. training. Preference in admission is given to students who intend to proceed to doctoral work, either directly or after completion of the M.A. degree.

The M.A. Program

The courses required for the M.A. degree usually include an introduction to research (HIST 700) and an introductory seminar (HIST 900), to be taken in the first year of study, a two-semester reading colloquium or its equivalent in the student's major field, one additional seminar (900-level course), three hours of thesis credit (HIST 993) and four other courses, of which as many as three may be taken in fields other than that in which the student is concentrating or even in other disciplines. M.A. candidates must also pass a reading-knowledge examination in an appropriate foreign language, prepare an acceptable thesis and pass an oral examination on the thesis. Students are expected to complete the M.A. after four semesters in residence.

The Ph.D. Program

Satisfactory completion of the M.A. does not automatically entitle a student to continue at the doctoral level. After the M.A. oral examination, the student's committee reaches a formal written decision about whether he or she should continue toward the Ph.D.

All courses taken at UNC-Chapel Hill for the M.A. (except HIST 993) may be credited toward the doctoral program. If The Graduate School approves for transfer credit graduate courses taken elsewhere, these may be credited as well. Candidates for the Ph.D. complete the following minimum course program (in addition to the requirements for the M.A.): a research seminar, two courses in a second field of study, research design (HIST 905) and dissertation credit (HIST 994). A read-

ing knowledge of two foreign languages is required for the Ph.D. degree.

Each doctoral student must pass written comprehensive examinations in the major field, as well as an oral examination that focuses on the dissertation. The final requirements for the Ph.D. are a dissertation and an oral examination on it.

The department expects doctoral students to proceed quickly with their work. For those pursuing both the M.A. and the Ph.D., all course work and the comprehensive written and oral examinations must be completed by the end of the seventh semester. For those who enter the program with an acceptable M.A. from another institution, A.B.D. status must be achieved within four semesters. The dissertation must be completed within a period of eight years.

Fellowships and Assistantships

The department funds most of its students through teaching assistantships or fellowships, and also offers research grants and dissertation fellowships. In addition, The Graduate School awards fellowships to both entering students and students in the later phases of their doctoral training. More details about funding for history students can be found at www.unc.edu/depts/history/grad/funding.html.

Libraries and Research Opportunities

The Davis and Wilson libraries have many collections of great value, and the University itself is conveniently situated close to a number of other research centers, particularly the Duke University Library and the North Carolina State Department of Archives and History (www.ah.dcr.state.nc.us). The library houses many outstanding special collections, including the William Henry Hoyt Collection on revolutionary France and the Peabody Collection on international law and diplomacy. Especially notable are the Southern Historical Collection (one of the most important manuscript collections on the subject), and the North Carolina Collection (a repository of books, magazines, pamphlets, and newspapers published in or about North Carolina). The Southern Oral History Program and the Center for the Study of the American South further enhance research and training in the history of our region.

The University Center for International Studies, the Center for European Studies and the Triangle Institute for Security Studies (TISS) sponsor fellowships, seminars, speakers and other opportunities in their respective areas. The Ancient World Mapping Center forms part of the Department of History, and there is no other unit worldwide that matches its mission of promoting cartography and geographic information science within ancient studies. For research and other initiatives at the center, visit www.unc.edu/awmc. The department also sponsors the Project for Historical Education, an outreach program for teachers in secondary schools. In addition, a wide variety of workshops regularly bring together faculty and graduate students who share interest in particular historical topics or approaches.

Courses for Graduates and Advanced Undergraduates

420 POLITICS AND RELIGION IN ANCIENT GREECE (3). This course deals with ancient Greek religious practices and seeks to place them in their legal, political and cultural contexts, and thus integrate them into the study of Greek history.

421 [101] ALEXANDER (PWAD 421) (3). The rise of Macedonia; the careers of Philip II and Alexander (with emphasis on the latter's campaigns); the emerging Hellenistic Age. The course integrates computer (including Web site) and audiovisual materials throughout. Spring. McCoy.

422 [102A] ANCIENT GREEK WARFARE (PWAD 422) (3). War and the warrior in the archaic and classical Greek world, seventh to the fourth centuries BCE. Spring. McCoy.

423 [102B] ANCIENT GREEK SOCIETY AND CULTURE (3). HIST 225 strongly recommended. Topical approach to the social and cultural history of the ancient Greek city states, ca. 800–336 BCE. Summer. McCoy.

424 [102C] ANCIENT ATHENS (3). HIST 225 strongly recommended. The life and times of the ancient Athenians from the sixth to fourth centuries BCE. Fall. McCoy.

425 [103] ROMAN HISTORY, 154 BCE–14 CE (3). Explores the transformation from Republic to Principate. Conducted in considerable part by student reports and classroom discussions. Talbert.

427 [104A] THE EARLY ROMAN EMPIRE, 14 CE–193 CE (3). Focuses upon administrative, social and economic themes. Conducted in considerable part by student reports and classroom discussions. Talbert.

428 [104B] THE LATER ROMAN EMPIRE, 193 CE–378 CE (3). Focuses upon administrative, social and economic themes. Conducted in considerable part by student reports and classroom discussions. Talbert.

431 [106] THE MEDIEVAL CHURCH (3). The nature and workings of the Western church between roughly 600 and 1300. Emphasis on the church "from within," organization, missionary strategies, liturgy, monasticism, popular religion. Pfaff.

433 [133] ENGLISH SOCIETY, 1200–1700 (3). Examines critical issues in the development of English society and economy in the centuries before industrialization.

434 [134] MEDIEVAL ENGLAND (3). A consideration of England's origins, unification and development as a national monarchy. Primary emphasis is on political, ecclesiastical and cultural aspects. Pfaff.

435 [110] THE MEDIEVAL UNIVERSITY (3). The origins and development of the university during the period 1100 to 1400; types of organization, curricula and degrees, intellectual life, town-gown and student-master relationships. McVaugh.

436 BETWEEN FLESH AND SPIRIT: GENDER, THE BODY AND THE HOLY IN MEDIEVAL CHRISTIANITY (3). This course will explore notions of male and female sanctity from Late Antiquity to the High Middle Ages. Topics will include martyrdom, the cult of relics and bodily resurrection.

452 [112] THE RENAISSANCE: ITALY, BIRTHPLACE OF THE RENAISSANCE, 1300–1550 (3). A study of the people, culture and intellectual achievements of the Italian Renaissance with emphasis on the interaction between culture and society. Bullard.

453 [113] MEDITERRANEAN SOCIETIES AND ECONOMICS IN THE RENAISSANCE WORLD (3). A picture of Mediterranean social and economic life 1300 to 1600, with special focus on rural and urban society, family structure, patronage, work and wages, public and private finance. Bullard.

454 [114] THE REFORMATION (RELI 454) (3). Examines a movement of religious reform that shattered Latin Christendom and contributed many of the conditions of early modern Europe. Emphases: religious, political, social.

455 [115] EUROPE IN THE 17TH CENTURY (3). The century marks the watershed in European development. Emphases: statecraft, the emerging state-system, the new scientific world view, the evolution of European society.

456 [116] 18TH-CENTURY FRANCE (3). This course examines the Age of Enlightenment in France (1660-1787). The ideas of the "philosophes" will be placed in a broad social, political and international context. Smith.

457 [117] THE FRENCH REVOLUTION (3). Origins and course of the French Revolution to 1815. Topics include the culture of the Enlightenment, collapse of the old regime, popular revolution, trial of Louis XVI, Reign of Terror, Napoleon. Smith.

458 [119] EUROPE AND THE WORLD WARS, 1914–1945 (3). Europe and the experience of total war, with special focus on national conflicts; ideological conflicts among fascism, communism and liberalism; and the dictatorships of Hitler and Stalin. Browning.

459 [120A] FRANCE, 1337–1715 (3). This course covers the social, political and cultural history of France from the later Middle Ages to 1715. The monarchy's evolution from near extinction to "absolutism" provides the main storyline. Smith.

460 LATE MEDIEVAL AND REFORMATION GERMANY (3). Examines the major late medieval religious, social and political developments plus the Reformation and Counter-Reformation. Topics include Luther's theology, the German Peasant's War, Jewish-Christian relations, witch-hunting and family life. Reid.

461 EARLY MODERN GERMANY, 1600–1815 (3). Examines major political, social and cultural developments. Topics include the growth of absolutist government, Prussia's militarism and rivalry with Austria, German Jewry, Baroque music, the Enlightenment and the Napoleonic wars. Reid.

462 [122] GERMANY, 1815–1918 (3). The nature of Prussian society, the rivalry between Prussia and Austria for the command of German affairs, and the quality of Prussian leadership in the German Empire of 1871. Jarausch.

463 [123] HISTORY OF GERMANY SINCE 1918 (3). Politics and culture in the Weimar Republic, Nazi totalitarianism and the reshaping of East and West Germany since World War II. Jarausch.

464 [124] HISTORY OF SPAIN (3). A survey of Spanish history from the Islamic invasion to Napoleon. Particular attention will be given to the period of the Hapsburgs, 1516 to 1700. Headley, Burns.

465 [125] INTELLECTUAL HISTORY OF EUROPE, EARLY PERIOD (3). The course examines the gradual erosion of and criticism within the classical Christian tradition that led to the emergence of a new mentality by the end of the 17th century. Two lectures, one discussion per week.

466 [126] MODERN EUROPEAN INTELLECTUAL HISTORY (3). The main developments in European thought from the Enlightenment to the 20th century, with some attention to social context. Readings include Voltaire, Rousseau, Hegel, Marx, Tocqueville, Sand, Flaubert, Nietzsche, Freud. Kramer.

467 [127A] SOCIETY AND FAMILY IN EARLY MODERN EUROPE (3). A survey of changes in social organization, family life, courtship practices, sexual behavior and the relations between the economy and population that occurred in preindustrial Europe, 1500–1815. McIntosh.

469 [128] EUROPEAN SOCIAL HISTORY, 1815–1970 (3). The social transformation of Europe from agrarian through postindustrial society, discussing population growth, family history, spread of education, class structure, social conflict, group ideologies and mass politics, as well as everyday lives and popular lifestyles. Jarausch.

470 [129] THE SCIENTIFIC REVOLUTION (3). Traces the creation of scientific thought 1500 to 1700, from Leonardo to Newton, examining the various strands—Greek science, art, engineering, experimentation, occultism, etc.—woven into it. McVaugh.

471 [130] HISTORY OF SCIENCE FROM NEWTON TO EINSTEIN (3). A survey of the development since 1700 of the various branches of physical and biological science, culminating in the 20th-century revolution in physics. McVaugh.

472 [131] MEDICINE AND HEALTH IN EARLY MODERN EUROPE (3). Shows how the age of Shakespeare and Newton (16th- to 17th-century England) fused old and new ideas about medicine and health, anticipating some of our own beliefs and practices. McVaugh.

473 [135] TUDOR AND STUART ENGLAND, 1485–1660 (3). A lecture course, open to juniors, seniors and graduate students. Harris.

474 [137] GREAT BRITAIN IN THE 19TH CENTURY, 1815–1901 (3). Emphasizes the social and economic foundations of the political, intellectual, religious and cultural history of Victorian Britain. Soloway.

475 [138] GREAT BRITAIN IN THE 20TH CENTURY (3). Explores the economic and social foundations of British political, intellectual and cultural history from 1901 to the present. Soloway.

476 [184] RUSSIA AND THE WEST IN THE 18TH CENTURY (3). A comparative approach. Centering on Russia's contacts with the West, the resulting interaction and the efforts of Russians to define the unique nature of their own society. Griffiths.

477 [186A] REVOLUTION IN RUSSIA, 1900–1930 (3). A close study of Russia's age of revolution from the reign of the last tsar to the turbulent Stalin Revolution of 1929, with emphasis on the revolutions of 1917. Raleigh.

478 [186B] STALIN AND AFTER: THE USSR, 1929–PRESENT (3). An in-depth examination of Soviet and post-Soviet history from 1929 to the present. Raleigh.

479 [079] HISTORY OF FEMALE SEXUALITIES IN THE WEST (WMST 479) (3). Spanning the ancient, medieval and modern West, this course explores normative and non-normative female sexualities, ideas about female bodies and the regulation of female sexuality by families, religions and states.

480 [185] RUSSIA, 1796–1917 (3). The diplomatic, military and ideological confrontations with the West, the decline and fall of the Russian autocracy, the evolution of reform thought; and revolutionary opposition. Brooks.

481 [190] EASTERN EUROPE SINCE WORLD WAR II (3). An examination of the countries of Eastern Europe, their origins and development since World War II, their cohesion and conflict.

482 [105] RUSSIA, EURASIAN EMPIRE (3). This course examines the development of the Russian Empire, from the Mongol conquest in the 13th century to the transformation of Imperial Russia in the Soviet Union after 1917.

490 [100] SPECIAL TOPICS IN HISTORY (3). Subject matter will vary with instructor but will focus on some particular topic or historical approach. Course description available from the departmental office.

500 GENDER AND NATION IN EUROPE AND BEYOND, FROM THE 18TH TO THE 20TH CENTURY (WMST 500). The course explores the growing body of research on gender and nation/nationalism by focusing on problems of national belongings, citizenship, state and nation formation, and national iconography.

501 GENDER OF WELFARE (WMST 501) (3). An interdisciplinary examination of issues pertaining to gender and welfare, such as the sexual division of labor and social policy, the work-family balance and social citizenship in a transnational perspective.

513 [140] IMPERIALISM AND THE THIRD WORLD (3). This course explores the processes by which 19th-century imperialism set the contours of the modern world, establishing relations among societies and reconfiguring both colonial cultures and European cultures. Lindsay.

514 [141] MONUMENTS AND MEMORY (ART 514, INTS 514) (3). Since the emergence of the idea of "public," museums and monuments have played a key role in the formation of cultural memory and identity, both nationally and globally. This course explores the relation between museums and monuments historically and theoretically, and relates them to national and international developments in the 19th and 20th centuries.

515 [143] HISTORY OF SOCIALIST THOUGHT (3). An examination of the origins and development of Marxist ideas and their application to specific historical conditions in Germany, Russia, China, Algeria, Cuba and modern industrial society. Griffiths.

516 HISTORICAL TIME (3). This course explores the ways in which Western historians and other students of the past from Adam Ferguson to Stephen Jay Gould have conceptualized and packaged historical time.

517 MILITARY, WAR AND GENDER IN COMPARATIVE PERSPECTIVE, 18TH TO THE 20TH CENTURY (3). This course introduces students to the gender history of the military and war in a comparative perspective with a focus on Germany and the United States from the 18th to the 20th century.

530 [175] HISTORY OF MEXICO (3). Topical approach to the history of Mexico, from pre-Columbian civilizations through the Spanish conquest and colonial system. Emphasis will be given to the 19th and 20th centuries. Pérez.

531 [176A] HISTORY OF THE CARIBBEAN (3). Thematic approach to the history of the West Indies, with emphasis on the period from European conquest through the 20th century. Topics include colonialism, slavery, monoculture, United States–Caribbean relations and decolonization. Pérez.

532 [176B] HISTORY OF CUBA (3). Thematic approach to Cuban history, from conquest to the revolution. Attention is given to socioeconomic developments, slavery and race relations, the 19th-century independence process and the 20th-century republic. Pérez.

533 [177] HISTORY OF BRAZIL (3). This course is concerned primarily with the creation of a new society through race mixture and culture change, and with the political and economic development of Brazil. Chasteen.

534 [180] THE AFRICAN DIASPORA (3). A comparative examination of the movements, experiences, and contributions of Africans and people of African descent from the period of the Atlantic slave trade to the present. Lindsay.

535 [182] WOMEN AND GENDER IN AFRICAN HISTORY (AFRI 535) (3). Analysis of historical transformations in Africa and their effects on women's lives and gender relations. Particular themes include precolonial societies, colonialism, religious change, urban labor, nationalism and sexuality. Lindsay.

536 [196] REVOLUTION IN THE MODERN MIDDLE EAST (ASIA 536) (3). This course will focus on revolutionary change in the Middle East during the last century, emphasizing internal social, economic and political conditions as well as international contexts. Shields.

537 [195] WOMEN IN THE MIDDLE EAST (ASIA 537, WMST 537) (3). Explores the lives of women in the Middle East and how they have changed over time. Focus will change each year. Shields.

538 [197] THE MIDDLE EAST AND THE WEST (ASIA 538) (3). This course explores changing interactions between the Middle East and the West, including trade, warfare, scientific exchange and imperialism, and ends with an analysis of contemporary relations in light of the legacy of the past. Shields.

539 [192] THE ECONOMIC HISTORY OF SOUTHEAST ASIA (ASIA 539) (3). This course is intended as a broad overview of Southeast Asian economic history from premodern times to the present day. Coclanis.

540 [109] AFRICAN INTELLECTUAL HISTORY: DISCOURSE, KNOWLEDGE, POLITICS (3). This course traces Africa's modern intellectual history, exploring such topics as Africa's place in history, African nationalism, pan-Africanism, the problem of colonialism and the meaning of progress.

541 AFRICAN ENVIRONMENTAL HISTORY: ECOLOGY, ECONOMY, POLITICS (3). This course addresses the major themes of the environmental history of Africa with an emphasis on issues of local ecology, land use, and labor and the struggles over these issues.

542 DEVELOPMENT IN AFRICA AND ITS DISCONTENTS (3). This course examines the changing meanings of the idea of development in Africa and the role that Africans have played in shaping these meanings from the late 19th century.

543 HISTORIES OF HEALTH AND HEALING IN AFRICA (3). This course focuses on the historical, social, medical, cultural, policy and economic aspects of health and health crises in Africa.

561 [145] THE AMERICAN COLONIAL EXPERIENCE (3). Major topics: European reconnaissance, founding of new societies, character and structure of institutions, thought and feeling from Cotton to Franklin, privilege and cost of empire. Higginbotham.

562 [173] ORAL HISTORY AND PERFORMANCE (COMM 562, FOLK 562, WMST 562) (3). This course will combine readings and field work in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history. Hall.

563 [147] JACKSONIAN AMERICA, 1815–1848 (3). The society and politics of the United States during the period dominated by President Andrew Jackson. Topics include economic development, the expansion of slavery, religion and reform, the changing roles of women and the political movements associated with "Jacksonian democracy." Watson.

564 [146] REVOLUTION AND NATION MAKING IN AMERICA, 1763–1815 (PWAD 564) (3). Major topics: constitutional conflict in the British empire, independence and war, Confederation and Constitution, growth of political parties and nationality in a period of domestic change and international conflict. Higginbotham.

565 [148] CIVIL WAR AND RECONSTRUCTION, 1848–1900 (PWAD 565) (3). Focus is on causes, nature and consequences of the Civil War. Barney.

566 [149] THE HISTORY OF SEXUALITY IN AMERICA (3). A history of the sexual practices, desires and understandings of Americans, from earliest colonial encounters to the late 20th century. Sweet.

568 [168] WOMEN IN THE SOUTH (WMST 568) (3). An exploration of the distinctive themes in Southern women's lives, using the evidence of history and literature. Hall.

569 AFRICAN AMERICAN WOMEN'S HISTORY (AFAM 569, WMST 569) (3). The course covers the history of black women in the United States from the 18th century to the present. It deals with such themes as work, family, community, sexuality, politics, religion and culture. Jackson.

570 [153A] THE VIETNAM WAR (ASIA 570, PWAD 570) (3). A wide-ranging exploration of America's longest war, from 19th-century origins to 1990s legacies, from village battlegrounds to the Cold War context, from national leadership to popular participation and impact. Hunt.

571 [142] SOUTHERN MUSIC (FOLK 571) (3). Explores the history of music in the American South from its roots to 20th-century musical forms, revealing how music serves as a window on the region's history and culture. Ferris.

573 [159] PUBLIC RELIGION IN U.S. HISTORY (3). Prerequisite, introductory history or religious studies course. A study of public religion in United States history, including the relations of religion and government, the idea of American exceptionalism and destiny, the role of religious movements.

574 [144] SPANISH BORDERLANDS IN NORTH AMERICA (3). The history of the Spanish colonial experience north of Mexico, to 1820.

576 [151A] THE ETHNOHISTORY OF NATIVE AMERICAN WOMEN (WMST 576) (3). Introduces students to the study of Native American women through the perspectives of anthropology, history and autobiography. Perdue.

577 [152] UNITED STATES FOREIGN RELATIONS IN THE 20TH CENTURY (PWAD 577) (3). How the United States came to occupy a leading role in world affairs as a diplomatic, military, economic and cultural power and what that role has meant to Americans and to other peoples, especially during the Cold War. Hunt.

579 [156] POPULAR CULTURE AND AMERICAN HISTORY (3). Study of the popular arts and entertainments of the 19th and 20th centuries and the ways in which they illuminate the values, assumptions, aspirations and fears of American society.

579H [156H] POPULAR CULTURE AND AMERICAN HISTORY (3).

580 [150] UNITED STATES HISTORY SINCE 1945 (3). Diverse developments as interpreted within the framework of certain broad and open-ended themes, particularly individual freedom, social welfare, mass culture and community. Filene.

581 [157] AMERICAN CONSTITUTIONAL HISTORY TO 1876 (3). In a classroom environment characterized by discussion, simulation and interaction, the antecedents, formation and interpretation of the Constitution are confronted in a broad historical matrix. Semonche.

582 [158] AMERICAN CONSTITUTIONAL HISTORY SINCE 1876 (3). Using a classroom environment similar to HIST 581, constitutional adjustments and change are related to psychological, political, social and economic factors, and to Supreme Court members. Semonche.

584 [162] THE PROMISE OF URBANIZATION: AMERICAN CITIES IN THE 19TH AND 20TH CENTURIES (3). A survey of the development of American cities since 1815 and their influence upon American history. Lotchin.

586 [163] THE OLD SOUTH (3). Economic, cultural and social history of the antebellum South. The region's political history will serve as a supporting part of the study. Watson.

587 [164] THE SOUTH SINCE RECONSTRUCTION (3). A survey of the South during the past 100 years, covering developments in politics, economics, culture and society. Course begins at the end of Reconstruction.

588 [167] WHITE CULTURE AND RACE RELATIONS IN THE SOUTH (3). This course describes and analyzes the evolution of Southern white culture with emphasis on the years since 1831. It describes Southern white culture as the result of the black presence.

589 RACE, RACISM AND AMERICA: (U.S.) LAW IN HISTORICAL PERSPECTIVE (3). This course will historically and critically examine the changing legal status of people of color in the United States. Within a broad historical matrix from the colonial era to the present, it will focus on African Americans, Native Americans, Asian Americans, Latina/os and United States law.

621 [171] RELIGIOUS HISTORY OF THE SOUTH (3). HIST 127, 128 or 140 recommended. A historical analysis of the religious life of Southerners from the Great Awakening to the present with an emphasis on how religion, social institutions and cultural practices interact.

622 [172] MEDICINE AND SOCIETY IN AMERICA (3). A survey of major developments in the history of American medicine. Emphasis will be placed upon setting the practice of medicine as well as the experience of health and disease into broad social, cultural and political contexts.

624 [181] INTELLECTUAL HISTORY OF AFRICAN AMERICANS (3). Examines African American intellectuals in North America with some attention to black writers in the Caribbean. Emphasizes American Negro Academy, black scholars, scholar-activists, writers and public intellectuals. Janken, McNeil.

625 [161] TECHNOLOGY AND AMERICAN CULTURE (3). Technology's impact on American thought and society and the response it has engendered. Topics will include the factory town, search for utopia, impact of Henry Ford, war and depersonalization. Kasson.

670 [170] INTRODUCTION TO ORAL HISTORY (FOLK 670) (3). Introduces students to the uses of interviews in historical research. Questions of ethics, interpretation and the construction of memory will be explored, and interviewing skills will be developed through field work. Hall.

671 INTRODUCTION TO PUBLIC HISTORY (3). Introduces the theory, politics and practice of historical work conducted in public venues (museums, historic sites, national parks, government agencies, archives), directed at public audiences, or addressed to public issues.

674 FIELD METHODS IN ARCHAEOLOGY AND HISTORY (3). This course will introduce many techniques employed by archaeologists and historians in locating and excavating sites of past human activity. It will involve field work at an active archeological site.

697 [094A] MYTH AND HISTORY (3). Myths and legends are the stuff of history. An interdisciplinary capstone course treating topics such as Alexander the Great and George Washington as mytho-historical heroes, the Holy Grail and uses of myth in the modern world.

Courses for Graduates

700 [200] INTRODUCTION TO HISTORICAL METHODS AND RESEARCH (3). Introduction to research. Required for all first-year students. Fall.

701 [201] INTRODUCTION TO MEDIEVAL STUDIES (3). This is an interdisciplinary course to introduce graduate students to the sources, methods and approaches of medieval studies.

702 [202] INTRODUCTION TO HISTORICAL EDUCATION (3). Provides an introduction to teaching history. Topics include the history of historical education, planning a course, the role of the teacher, goals and methods, using new technologies and evaluating students. Spring. Filene, Shields.

703 [211] TEACHING PRACTICUM.

705 [283] CULTURAL THEORY AND HISTORICAL METHODS (3). Introduction to theoretical and methodological issues that have influenced historical studies in the 1980s and 1990s. Works considered are from anthropology, literary studies, colonial and postcolonial studies, and poststructuralism.

711 [203A] INTRODUCTORY COLLOQUIUM ON EARLY MODERN EUROPE (3). Directed readings on early European history, from Britain through European Russia. Fall. (Alternate years.)

712 [203B] INTRODUCTORY COLLOQUIUM ON MODERN EUROPE (3). Directed readings on modern European history, from Britain through European Russia. Spring.

713 [207A] INTRODUCTORY COLLOQUIUM IN LATIN AMERICAN HISTORY BEFORE 1810 (3). Directed readings on Latin American history from preconquest to 1810; required for students entering the field. Fall. Burns.

714 [207B] INTRODUCTORY COLLOQUIUM IN THE HISTORY OF LATIN AMERICA SINCE 1810. Directed readings on Latin American history in the National Period; required for students entering the field. Spring. Chasteen, Perez.

715 [209A] INTRODUCTORY COLLOQUIUM IN UNITED STATES HISTORY TO 1865 (3). Directed readings on American history through the Civil War; required for students entering the field. Fall.

716 [209B] INTRODUCTORY COLLOQUIUM IN UNITED STATES HISTORY SINCE 1865 (3). Directed readings on American history from the Civil War to the present; required for students entering the field. Spring.

717 [261] INTRODUCTION TO MILITARY HISTORY (3). An introduction to the methods, issues, and literature of military history, including classic works and scholarship representative of a variety of approaches from history and other disciplines. Fall. Kohn.

718 [225] COLLOQUIUM IN WORLD MILITARY HISTORY (3). Reading colloquium in world military history, emphasizing Europe, focusing on the most significant issues, methods and approaches in the field today. Kohn.

721 [205A] READINGS IN EUROPEAN EXPANSION AND GLOBAL INTERACTION, 1400–1800 (3). Examines the dynamics of cross cultural contacts and exchange between Europe and other civilizations in the context of a growing global interconnectedness. Spring. (Alternate years.)

722 [205B] READINGS IN CONTEMPORARY GLOBAL HISTORY (3). Focus on the 19th and 20th centuries. Mixing theory, case studies and comparisons, the readings reflect disciplinary diversity. Fall.

725 [222] SELECTED READINGS IN THE COMPARATIVE OR GLOBAL HISTORY OF WOMEN IN GENDER (WMST 725) (3). Readings in the history of women and gender in a comparative, global or transnational perspective. (Alternate springs.) Staff.

730 [228] FEMINIST AND GENDER THEORY FOR HISTORIANS (WMST 730) (3). Readings in contemporary feminist theory, focused especially on theories that address the construction, writing and general practice of history. Spring. (Alternate years with HIST 222.)

735 [218] READINGS IN THE HISTORY OF SEXUALITY AND GENDER (WMST 735) (3). Readings on the historical study of gender and sexuality and on definitions of femininity and masculinity in different historical contexts. Fall and spring. Hoffert.

741 [229] READINGS IN THE HISTORY OF SCIENCE AND MEDICINE (3). Examines the principal historiographical problems in the history of science and medicine, focusing on a different topic each year. McVaugh.

746 [245] HISTORY AND THE SOCIAL SCIENCES (3). The relationship of the social sciences to history, logic of inquiry, use of quantitative methods and introduction to the computer. Jarausch.

751 [206] PROBLEMS IN GREEK HISTORY, 600–323 B.C. (3). Prerequisite, consent of the instructor. McCoy.

752 [208] HISTORY OF ROME, 27 B.C.–180 A.D. (3). Talbert.

755 [223] READINGS IN MEDIEVAL AND EARLY MODERN WOMEN'S HISTORY (WMST 755) (3). A readings course on the history of women, gender and sexuality in Medieval Europe.

756 [239] MEDIEVAL ENGLAND (3). Prerequisite, HIST 137 or equivalent. Pfaff.

757 [243] LATE MEDIEVAL ENGLAND (3). Prerequisite, HIST 133, 134 or equivalent. Readings in English history, ca. 1300–1500, with a focus on social, economic, political and legal topics.

760 [219] EUROPE IN THE 16TH CENTURY (3). A survey of the best historical literature emphasizing churches, varieties of secular power and religious practice.

761 [227] READINGS IN EARLY MODERN EUROPEAN HISTORY (3). Bullard.

762 [238] POLITICAL AND INTELLECTUAL HISTORY OF ENGLAND UNDER THE TUDORS AND THE STUARTS (3). Prerequisite, HIST 138. Harris.

763 [230] EARLY MODERN GERMANY (3). A topical survey of the political, social and economic history of early modern Germany. McIntosh.

765 [233] PROBLEMS IN THE HISTORY OF THE FRENCH REVOLUTION (3). Readings, reports and discussion on aspects of the French Revolutionary upheaval in Europe. Smith.

770 [220] READINGS IN MODERN EUROPEAN WOMEN'S AND GENDER HISTORY (WMST 220) (3). A readings course in the history of women in Europe since 1500. Harris.

771 [234] TOPICS IN MODERN EUROPEAN HISTORY (3). Jarausch.

772 [226] READINGS IN THE INTELLECTUAL HISTORY OF EUROPE (3). A readings course on specific themes and debates in modern European intellectual life. Kramer.

773 [235] READINGS IN EUROPEAN SOCIAL HISTORY (3). Reid.

774 [236] READINGS IN MODERN EUROPEAN HISTORY, 1918–1945 (3). Browning.

775 [240] STUDIES IN MODERN ENGLISH HISTORY (3). Directed readings in 19th- and 20th-century English history. Topics vary from year to year. Soloway.

776 [232] TOPICS IN FRENCH HISTORY (3). Open to graduate students from all departments. This course examines one period or one set of problems within French history since the Renaissance. Topics determined by instructor. Kramer, Reid, Smith.

780 [204A] READINGS IN RUSSIAN HISTORY BEFORE 1796 (3). Griffiths.

781 [204B] READINGS IN RUSSIAN HISTORY, 1796–1917 (3). Brooks.

782 [204C] READINGS IN SOVIET HISTORY (3). Raleigh.

783 [204D] SPECIAL TOPICS IN RUSSIAN AND EAST EUROPEAN HISTORY (3).

784 [210] READINGS IN EAST EUROPEAN HISTORY (3). Directed readings on modern East European history.

810 [215] READINGS IN THE HISTORY OF THE MIDDLE EAST (3). Shields.

820 [270] PROBLEMS IN LATIN AMERICAN HISTORY (3). Burns, Chasteen, Pérez.

831 [249] READINGS IN EARLY AMERICAN HISTORY (3).

832 [250] THE AMERICAN REVOLUTIONARY ERA, 1763–1789 (3). Higginbotham.

833 [251] THE UNITED STATES IN THE FEDERAL PERIOD, 1789–1820 (3). Readings, discussion and book lists designed to give familiarity with the historiographical problems, research opportunities and bibliography of the period. Higginbotham.

834 [252] THE UNITED STATES IN THE MIDDLE PERIOD, 1815–1860 (3). An analysis of the material and ideological transformations within the antebellum republic, which climaxed in the sectional crisis of the 1850s. Barney.

835 [263] READINGS IN THE ANTEBELLUM SOUTH (3). A review of traditional and modern literature on the pre-Civil War South, focusing on the interrelationships of its economy, society, culture and politics. Watson.

840 [254] CIVIL WAR AND RECONSTRUCTION, 1860–1876 (3). Barney.

841 [264] READINGS IN THE SOUTH SINCE RECONSTRUCTION (3). Readings, reports and discussions on selected topics with a view to gaining familiarity with the literature of the field. Leloudis.

842 [259] POLITICAL AND SOCIAL HISTORY OF MODERN AMERICA (3). A course of readings for advanced students that relate social history to the history of the state in America in the period from the Great Depression and the New Deal to the present.

850 [256] RECENT AND CONTEMPORARY UNITED STATES (3).

860 [262] COLLOQUIUM IN UNITED STATES MILITARY HISTORY (3). Reading colloquium in United States military history focusing on the most significant issues, methods and approaches in the field today. Kohn.

861 [244] HISTORY OF U.S. FOREIGN RELATIONS (3). Hunt.

863 [217] READINGS IN URBAN HISTORY (3). A readings course to introduce students to the main topics in urban history. Lotchin.

865 [221] READINGS IN U. S. WOMEN'S AND GENDER HISTORY (WMST 865) (3). A readings course on the history of women in the United States. Hall.

870 [265] READINGS IN AFRICAN AMERICAN HISTORY (3). Graduate students compile bibliographies and read important contributions to various aspects of African American history, stressing shifts in African American historiography and including very recent works.

875 [269] TOPICS IN AMERICAN CULTURAL HISTORY (3). Kasson.

878 [248] READINGS IN NATIVE AMERICAN HISTORY (AMST 878) (3). Readings in and discussions of the major works in Native American history. Perdue, Green.

880 [282] AMERICAN FILM AND MEDIA HISTORY (AMST 880) (3).

890 [290] TOPICS IN HISTORY FOR GRADUATES (3). Instructors use this course to focus on particular topics or historical approaches. Specific course descriptions are available each semester on the departmental Web site (www.unc.edu/depts/history).

899 [299] INDEPENDENT STUDY FOR GRADUATE STUDENTS (3). Independent reading programs for graduate students whose needs are covered by no course immediately available. Consent of the instructor required. For students resident in Chapel Hill or vicinity.

900 [300] GRADUATE STUDIES IN HISTORY: SECOND COURSE (3). Application of research skills to historical investigation. Required for all first-year students. Spring.

901 [391] M.A. RESEARCH SEMINAR (3). A seminar for those preparing the M.A. thesis. Pursuing original research in primary sources, students prepare full drafts of their theses. Fall.

902 [392] PH.D. RESEARCH SEMINAR (3). A research seminar for students beyond the M.A. but not yet A.B.D. Spring.

905 [399] DISSERTATION PRACTICUM (3). Required of all doctoral candidates in the last semester of course work, this practicum helps students refine a dissertation topic and produce a prospectus. Fall.

906 [394B] DISSERTATION SEMINAR (3). A seminar for A.B.D. students, offered as demand and resources permit.

910 [301] ANCIENT HISTORY (3).

911 [311] MEDIEVAL HISTORY (3).

919 [319] SEMINAR IN EARLY MODERN EUROPEAN HISTORY (3).

924 [324] SEMINAR IN MODERN EUROPEAN HISTORY (3).

925 [325] SEMINAR IN RUSSIAN AND EAST EUROPEAN HISTORY (3).

930 [330] AMERICAN REVOLUTION, 1763–1789 (3).

942 [342] SEMINAR IN AFRICAN AMERICAN HISTORY (3).

948 [348] RESEARCH IN NATIVE AMERICAN HISTORY (AMST 348) (3).

950 [350] SEMINAR IN THE HISTORY OF SCIENCE (3).

951 [361A] INTRODUCTORY SEMINAR IN MILITARY HISTORY (3).

952 [361B] ADVANCED SEMINAR IN MILITARY HISTORY (3).

971 [371] SEMINAR IN LATIN AMERICAN HISTORY (3).

975 [387] SEMINAR ON WOMEN'S AND GENDER HISTORY (WMST 387) (3).

990 [390] SEMINAR IN HISTORY (3). Given on demand and as resources permit, this seminar allows faculty to respond to student interest in particular topics. Fall.

993 [393] MASTER'S THESIS (3 or more). Individual work on the M.A. thesis, pursued under the supervision of the M.A. advisor.

994 [394A] DOCTORAL DISSERTATION (3 or more). Individual work on the doctoral dissertation, pursued under the supervision of the Ph.D. advisor.

Human Movement Science

www.med.unc.edu/ahs/hmsc

CAROL A. GIULIANI, *Curriculum Director*

Professors

William Garrett, Orthopedics and Sports Medicine

Carol A. Giuliani (28) Neural Basis of Motor Control, Disability in Aging, Stroke Recovery, Movement Analysis

Edward Grant, Robotics, Biomedical Systems, Neural Networks, Biomedical Sensors, and Medical Devices

Michael T. Gross (29) Biomechanics, Sports Medicine, Orthopedics, Orthotics

Kevin M. Guskiewicz (24) Athletic Training, Anatomy

Anthony C. Hackney (21) Exercise Physiology, Metabolism, Endocrinology

Henry S. Hsiao (03) Medical Instrumentation, Interfacing Microprocessors to Physiological Transducers, Telemedicine

Michael Y. Lee (04) Neurological Rehabilitation, Clinical Neurophysiology, Acupuncture

Carol L. Lucas (01) Digital Signal Processing, Mathematical Modeling and Simulation, Pulmonary Circulation in Newborns and Infants

Robert G. McMurray (13) Physiology of Exercise Disease, Energy Expenditure of Children

Frederick O. Mueller (07) Epidemiology of Athletic Injuries, Administration, Sports Medicine

William E. Prentice (15) Athletic Training, Sports Medicine

Richard Segal (48) Role of Spinal Circuits and Supraspinal Systems during Upper Limb Movement and Walking, Neuro Plasticity of Spinal Circuits

Darlene K. Sekerak (25) Pediatrics, Health Policy, Research Utilization

Jan Busby-Whitehead (08) Geriatric Medicine

Associate Professors

Bonita Marks (26) Exercise Physiology, Aging, Physical Activity and Health

Steve Marshall (199) Injury Epidemiology, Occupational Epidemiology, Methodology

Karen McCulloch (39) Balance Control in Neurologic Populations, Intervention in Stroke and Brain Injury, Cognitive Processes

Vicki S. Mercer (40) Motor Control, Motor Learning, Posture and Balance across the Lifespan, Stroke Recovery

Miriam Morey, Exercise Physiology, Epidemiology, Aging and Exercise, Physical Activity and Health

Darin Padua (22) Biomechanics and Sports Medicine Marie A. Reilly (35) Early Human Behavior and Development, Behavioral Motor Control, Developmental Disabilities

Debbie E. Thorpe (46) Pediatrics, Motor Learning, Developmental Disabilities, Aquatics Paul S. Weinhold (02) Biomechanics of Repetitive Motion Injury, Tissue Engineering

Philip L. Witt (22) Ergonomics Intervention, Research Design, Orthopedics, Spinal Dysfunction

Bing Yu (43) Biomechanics, Rehabilitation, Movement Analysis, Biomechanical Modeling

Assistant Professors

Claudio Battaglini (032) Management of Cancer Treatment-Related Symptoms, Prescriptive Exercise Intervention

Troy Blackburn, Neuromuscular Function and Motor Control

Janet K. Freburger (45) Health Sciences Research, Research Design, Biomechanics, Orthopedics

Michael Lewek, Aging and Function, Biomechanics

Thelma Mielenz (44) Orthopedics, Epidemiology, Arthritis

Joseph Myers, Neuromuscular Research and Orthopedics

Jama L. Purser, Epidemiology, Aging and Function

Angela Rosenberg (47) Pediatrics and Community Resources

Program Description: Doctor of Philosophy

The Department of Allied Health Sciences in the School of Medicine offers an interdisciplinary program of study in human movement science leading to the doctor of philosophy degree. The intent of this program is to develop research and teaching scholars who are capable of producing and disseminating new knowledge in the field of human movement science.

The doctoral program in human movement science is offered with the cooperative effort of the following departments/divisions at UNC-Chapel Hill: Physical Therapy, Exercise and Sport Science, Biomedical Engineering, Orthopedics, Physical Medicine and Rehabilitation, and

the Program on Aging. This program is designed to provide students an opportunity for doctoral study in areas that will increase our knowledge of human movement performance. The program focuses on contributing to the scientific basis of human movement, developing theory and methods for maintaining health, preventing disability, and improving movement ability. Focusing on normal movement and movement disability requires a special emphasis in research and education that draws upon yet differs from the focus of related sciences. Students of varied academic disciplines are accepted into the program. Students choose one of three tracks as a focus for their coursework and research experiences:

1) Biomechanics of human movement, including musculoskeletal mechanics and external mechanical constraints
2) Physiology of human movement, including exercise response and training in nondisabled and special populations
3) Motor control and motor learning, including neuromuscular control and behavioral analyses of human movement

(The Division of Physical Therapy retired the M.S. in Human Movement Science degree, so applicants are no longer being accepted for the M.S. as a terminal degree. Bachelor's level applicants will be considered, given appropriate background and experience in movement science research.)

Program Requirements

The curriculum core requirements allow flexibility in designing programs of study to meet the needs of each track and the student's interests. Other specific requirements will vary depending on the student's background and program track. Each student's program of study is developed under the guidance of his or her advisor and committee. Among these requirements are the core courses HMSC 700A, B, and C: Scientific Basis of Human Movement. Degree requirements also include a first year review, a doctoral written exam, a preliminary oral exam, a dissertation defense and a written dissertation. Other specific requirements will vary depending on the student's background and program track.

Research Facilities

Several research facilities are available for students in the departments participating in the program. These include the Orthopedic Biomechanics Laboratory in the Department of Orthopedics, the Motion Analysis, Motor Behavior and Observational Studies Laboratories in the Division of Physical Therapy's Center for Human Movement Science, and the Applied Physiology, Cadaver/Anatomy and Sports Medicine Laboratories in the Department of Exercise and Sport Science. These laboratories are equipped with state-of-the-art instruments for measuring a wide range of human performance which includes behavioral, physiological, biomechanical and computer modeling.

Admission

Student selection is based primarily on academic records and research experience. Requirements include the following:

- A master's degree in a field related to human movement—e.g., physical therapy, exercise science, biomedical engineering, anatomy
- A grade point average of B or better in the last two years of the student's undergraduate program
- Graduate Record Examination (GRE) test with minimum scores in the 50th percentile for both the verbal and quantitative sections, and Test of English as a Foreign Language (TOEFL) scores above 550 for international students, with a minimum score of 50 on all three sections
- Prerequisite courses:
  a. Introductory graduate-level statistics
  b. Human anatomy
  c. Human physiology
  d. Physics
  e. Chemistry
  f. Psychology

Because of the varied backgrounds of applicants, decisions on additional prerequisite preparation for each student will be decided by the Graduate Education Committee.

- Three letters of academic recommendation
- Curriculum vitae
- Written statement of the academic/career goals and research interests
- Applicants should indicate the name of the faculty member who has agreed to mentor them
- Applicants are strongly encouraged to contact a faculty member in their area of interest

Courses

Course work appropriate for the student's area of interest may be taken from a wide range of departments. The courses listed here are examples, but are not meant to be inclusive. (Please refer to departmental listings for full course descriptions.)

Biomedical Engineering

BMME 410 [106] SIGNALS AND SYSTEMS.

BMME 430 [121] DIGITAL SIGNAL PROCESSING.

BMME 450 [132] LINEAR CONTROL THEORY.

BMME 465 [111] INTRODUCTION TO BIOMEDICAL INSTRUMENTATION.

BMME 480 [120] REAL-TIME COMPUTER.

BMME 510 [112] BIOMATERIALS/BIOCOMPATIBILITY.

BMME 520 [160] FUNDAMENTALS OF MATERIALS ENGINEERING.

BMME 705 [260] MATERIALS ENGINEERING.

BMME 750 [232] DIGITAL CONTROL THEORY.

Exercise and Sport Science

EXSS 730 [230] MANAGEMENT OF ATHLETIC INJURIES.

EXSS 732 [232] GROSS ANATOMY FOR ATHLETIC TRAINERS.

EXSS 735 [235] SPORTS MEDICINE ANALYSIS: SPECIAL PROBLEMS RELATED TO SPORTS MEDICINE.

EXSS 739 [239] PRACTICUM IN ATHLETIC TRAINING.

EXSS 742 [255] SOCIAL ISSUES IN PHYSICAL EDUCATION AND SPORT.

EXSS 780 [280] PHYSIOLOGY OF EXERCISE.

EXSS 781 [281] CLINICAL EXERCISE PRESCRIPTION & TESTING.

EXSS 782 [282] NUTRITIONAL ASPECTS OF EXERCISE.

EXSS 783 [283] ASSESSMENT OF PHYSIOLOGICAL FUNCTION IN EXERCISE.

EXSS 785 [285] SEMINAR IN EXERCISE PHYSIOLOGY.

EXSS 890 [300] SPECIAL TOPICS IN EXERCISE AND SPORT SCIENCE.

EXSS 990 [320] RESEARCH IN EXERCISE AND SPORT SCIENCE.

Human Movement

HMSC 700 [200A] SCIENTIFIC BASIS OF HUMAN MOTION.

HMSC 701 [200B] SCIENTIFIC BASIS OF HUMAN MOTION.

HMSC 702 [200C] PHYSIOLOGY OF EXERCISE.

HMSC 710 [210] MUSCLE MECHANICS AND ELECTROMYOGRAPHIC KINESIOLOGY.

HMSC 743 [243] TOPICS IN MOTOR CONTROL AND MOTOR LEARNING: THERAPEUTIC IMPLICATIONS.

HMSC 770 [170] ELECTRONICS FOR HUMAN MOVEMENT SCIENCE.

HMSC 780 [280] INTRODUCTION TO OUTCOMES RESEARCH IN HEALTH CARE.

HMSC 782 [282] INFANT AND FAMILY ASSESSMENT.

HMSC 782L [282L] LABORATORY IN INFANT AND FAMILY ASSESSMENT.

HMSC 790 [290] ADVANCED KINESIOLOGY AND BIOMECHANICS.

HMSC 791 [291] ANALYSIS OF HUMAN MOTION.

HMSC 801 [301] SEMINAR IN HUMAN MOVEMENT SCIENCE.

HMSC 803 [303] PROBLEMS IN HUMAN MOVEMENT SCIENCE.

HMSC 811 [311] BASIC ASPECTS OF AGING (MEDI 486) (DECO 486).

HMSC 877 [377] INDEPENDENT STUDY IN HUMAN MOVEMENT SCIENCE.

HMSC 879 [379] RESEARCH IN HUMAN MOVEMENT SCIENCE.

HMSC 881 [381] THE NEURAL BASIS OF MOTOR CONTROL.

HMSC 886 [386] UNDERSTANDING RESEARCH.

HMSC 887 [387] DEVELOPMENTAL MOTOR CONTROL.

HMSC 904I [604] AGING AND HEALTH (DENT 604, DPET 604I, EPID 620I, MEDI 604, NURS 782I, PHYT 904I, PSYC 904I, SOCI 824, SOWO 604I).

HMSC 911I [611] MOVEMENT AND BALANCE IN AGING.

Interdisciplinary Human Movement Science

IHMS 850 [350] ISSUES IN MOTOR CONTROL AND MOTOR LEARNING.

IHMS 870 [370] DOCTORAL DEVELOPMENT SEMINAR.

IHMS 994 [394] DOCTORAL DISSERTATION.

School of Information and Library Science

sils.unc.edu

JOSÉ-MARIE GRIFFITHS, *Dean*
Evelyn Daniel, *Senior Associate Dean for Academic Affairs*
Jeffrey Tibbs, *Associate Dean for Administration*

Professors

José-Marie Griffiths
Evelyn H. Daniel
Stephanie W. Haas
Robert M. Losee
Gary J. Marchionini
Joanne Gard Marshall
Sarah C. Michalak
Barbara B. Moran
Jerry D. Saye
Helen R. Tibbo
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Associate Professors

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Jane Greenberg
Bradley M. Hemminger
Sandra Hughes-Hassell
Mostafa, Javed
Brian W. Sturm

Assistant Professors

Catherine L. Blake
Diane Kelly
Christopher Lee
Jeffrey Pomerantz

Instructors

Paul Jones
Phillip Edwards

Adjunct Faculty

Angela Bardeen, Social Science Information
Todd Barlow, Human Computer Interaction
Ronald Bergquist, Public Libraries, Information Technology
Rob Capra, Database, Personal Information Management
Scott Childs, Legal Information
Dean Jackie, Archives
Beth Doyle, Preservation
Joel Dunn, Systems Analysis and Design, Information Systems Management
David Ernsthausen, Business Information
Serena Fenton, Visual Design
Alan Forrest, Distributed Systems Administration
Laura N. Gasaway, Copyright, Law Librarianship
Bil Hays, Internet Applications, Networking, Systems Administration
Anne Kleinfelter, Law Librarianship
Selden Durgom Lamoureux, Serials Librarianship
Charles B. McNamara, Rare Book Librarianship
Bill Meyers, Information Systems Security
Suchi Mohanty, User Instruction, Reference Services
Anne L. Morisseau, E-learning, Online Searching
Rita Moss, Business Information
Thomas Nixon, Reference Services, Humanities Information
Lisa Norberg, User Instruction, Reference Services
Pam Pease, Children's Literature
Connie Schardt, Health Science Librarianship
Pam Sessoms, Reference Services
Matthew Turi, Archives
Michael Van Fossen, Government Documents
Rebecca Vargha, Special Libraries, Knowledge Management

Distinguished Research Professor

Donald W. King, Evaluation, Statistics

Professors Emeriti

Robert Broadus
Raymond L. Carpenter
Evelyn H. Daniel
Joe A. Hewitt
Edward G. Holley
William M. Shaw Jr.

The programs of the School of Information and Library Science (SILS) are designed to prepare students for professional employment and advanced study in the fields of information and library science. The school offers graduate instruction leading to the degrees of master of science in information science (M.S.I.S.) and master of science in library science (M.S.L.S.), certificate of advanced study (C.A.S.), and doctor of philosophy (Ph.D.) in information and library science. The school also offers an undergraduate minor in information systems and an undergraduate major in information science (B.S.I.S.).

The M.S.I.S. is designed to prepare students to contribute to the design, development and maintenance of information systems and networks; to provide leadership in the development of new technologies and new applications relating to the delivery of information to people seeking and utilizing information; and to demonstrate a theoretical knowledge of information science, including the theory of information storage and retrieval, systems science, and social, political and ethical implications of information systems. Within this degree program, students complete a core set of courses and build their own specialized program of studies on this foundation. Areas where students find jobs include (among others) database design and administration, interface design and usability testing, network administration, systems analysis and design, systems administration, user training and support, information resources/knowledge management, information systems security, competitive intelligence and Web site design and management. The M.S.L.S. program prepares students for professional employment in information and library service. The degree is designed to prepare students for work involving the collection, organization, storage and retrieval of recorded knowledge for a variety of individuals, groups and contexts. Analysis and design skills are emphasized. Areas where students find jobs include library administration, administration of archives and manuscript collections, records management, documents librarianship, cataloging, public and reference services, acquisitions and collection management, children's librarianship, access and manipulation of database information, special collections, various subject areas and systems librarianship. Graduates of the program are ready to practice within various settings: academic, public or special libraries, information centers or school library media centers.

Each master's student is required to complete one course in each of the curriculum's five functional areas: organization, collection/retrieval, human information behavior, design/evaluation and management. A course in Information Tools (INLS 461), which provides students with a foundation in various tools (e.g., html, database) employed in the curriculum is also required as is a course in Research Methods (INLS 780). The remainder of the 48 credit hours of course work is then selected, in consultation with the student's faculty advisor, from the information and library science curriculum, or as appropriate, from related subject fields in other schools and departments of the University. A master's paper is also required of each master's student. A theme within the curriculum for both master's degrees is evidence-based practice, which requires students to interpret and apply the research of others to their professional situations, as well as to be able to design and conduct their own research where necessary data is not otherwise available.

Certificates of specialization within either the master of science in library science (M.S.L.S.) or the master of science in information science (M.S.I.S.) are available in the following areas: aging, bioinformatics and international development. A program leading to a certificate as a school library media coordinate is also available as part of the master of science in library science (M.S.L.S.).

The School of Information and Library Science participates in several dual or cooperative degree programs. These include dual degree programs with:

- the Kenan–Flagler Business School, which combines the master of business administration (M.B.A.) degree and the master of science in information science (M.S.I.S.) degree.
- the Department of Health Policy Administration, School of Public Health, which combines the master of health administration (M.H.A.) degree with either the master of science in library science (M.S.L.S.) or master of science in information science (M.S.I.S.) degree.
- the School of Nursing, which combines the master of science in nursing with either the master of science in information science (M.S.I.S.) or master of science in library science (M.S.L.S.) degree.
- the Department of Art, which combines the master of arts in art history with either the master of science in information science (M.S.I.S.) or master of science in library science (M.S.L.S.) degree.
- the School of Government, which combines the master of public administration with either the master of science in information science (M.S.I.S.) or master of science in library science (M.S.L.S.) degree.
- the School of Law, which combines the M.S.L.S. and M.S.I.S. with the J.D. degree.

A cooperative archival program allows students to combine the master of arts (M.A.) in public history at North Carolina State University with either the master of science in library science (M.S.L.S.) or the master of science in information science (M.S.I.S.) with specializations in archival science. A similar dual degree cooperative program with Duke University's School of Medicine allows students to combine a degree in medicine with a degree in library or information science.

Participation in any dual degree program requires separate admission to both degree programs.

The basic requirement for admission to the master's programs is a bachelor's degree from a recognized college or university. The student's undergraduate work should demonstrate a strong foundation in liberal arts and sciences. Admission involves meeting the requirements for The Graduate School, which include submission of acceptable scores on the General Test of the Graduate Record Examination (GRE). For details about the entrance requirements and the curriculum for the master's programs, see the catalog of the School of Information and Library Science, which is available on the Web at sils.unc.edu/programs.

The certificate of advanced study (C.A.S.) in information and library science is a 30-semester-hour post-master's degree program that is designed for practitioners who seek an articulated and systematic continuing education program to enhance their professional career development in information and library science. The doctor of philosophy in information and library science (Ph.D.) is a research degree. Thus, the purpose of the doctoral program in SILS is to educate scholars who are capable of addressing problems of scholarly consequence in the field of information and library science. Toward this end each student develops a program of studies, which is tailored to individual interests and career goals. Required classes include a year-long seminar on Research Issues and Questions (INLS 881/882) and completion of an appropriate sequence of courses in statistics. Additional courses in research methods and theory development are recommended, as are research experience and substantive content courses, which are related to a student's research interests. There are also opportunities for students to develop teaching skills through both course work and teaching experience.

The school occupies three floors of Manning Hall, with the administrative and faculty offices, classrooms, ibiblio.org (one of the most popular Web sites on the Internet) and the Information and Technology Resource Center (ITRC) all contained in that building. The ITRC includes the Information and Library Science Library, which holds more than 93,000 volumes, and computer labs. Wireless network access is available in Manning Hall and many other locations on campus; direct connections to the campus network are also available in the ITRC.

Those interested in any of the SILS degree programs should see the SILS Web site (sils.unc.edu) or request information from the School of Information and Library Science, CB #3360, 100 Manning Hall, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3360. (E-mail: info@ils.unc.edu)

NOTE: The prefix for all School of Information and Library Science courses is INLS. When a prerequisite is listed for a course, it may be assumed that an equivalent course taken elsewhere or permission of the instructor also fulfills the prerequisite or corequisite. The course instructor must approve the equivalency of the substitute course.

Although graduate students may take courses numbered below 400, they will not receive credit toward a graduate degree for those courses.

Courses for Graduates and Advanced Undergraduates

461 INFORMATION TOOLS (3). This course may not be taken if the student has already taken INLS 261. Tools and concepts for information use. Information literacy, microcomputer software use and maintenance, microcomputer applications and networked information systems. Bergquist and Kelly

485 NATURAL LANGUAGE PROCESSING (3). Prerequisite, COMP 101, 121 or 161. Statistical, syntactic and semantic models of natural language. Tools and techniques needed to implement language analysis and generation processes on the computer. Haas.

490 SELECTED TOPICS (1–3). Exploration of an introductory-level special topic not otherwise covered in the curriculum. Previous offerings of these courses do not predict their future availability; new courses may replace these. Staff.

500 HUMAN INFORMATION INTERACTIONS (3). The behavioral and cognitive activities of those who interact with information, with emphasis on the role of information mediators. How information needs are recognized and resolved; use and dissemination of information. Barreau, Marchionini.

501 INFORMATION RESOURCES AND SERVICES (3). Pre- or corequisite, INLS 461. Analysis, use and evaluation of information and reference systems, services and tools with attention to printed and electronic modes of delivery. Provides a foundation in search techniques for electronic information retrieval, question negotiation and interviewing. Gollop, Pomerantz, Norberg.

501L COMPUTER LABORATORY TO SUPPORT INLS 501 (0.5). Corequisite, INLS 501. Focus on electronic retrieval techniques.

509 INFORMATION RETRIEVAL (COMP 487) (3). Study of information retrieval and question answering techniques, including document classification, retrieval and evaluation techniques, handling of large data collections and the use of feedback. Losee.

512 APPLICATIONS OF NATURAL LANGUAGE PROCESSING (COMP 486) (3). Prerequisite, COMP 110, 116 or 121, or graduate standing in information and library science. Study of applications of natural language processing techniques and the representations and processes needed to support them. Topics include interfaces, text retrieval, machine translation, speech processing and text generation. Haas.

513 RESOURCE SELECTION AND EVALUATION (3). Identification, provision and evaluation of resources to meet primary needs of clientele in different institutional environments. Carr, Edwards.

520 ORGANIZATION OF INFORMATION (3). Introduction to the problems and methods of organizing information, including information structures, knowledge schemata, data structures, terminological control, index language functions and implications for searching. Greenberg.

521 ORGANIZATION OF MATERIALS I (3). Prerequisite, ability to use e-mail, word processing, spreadsheet and Internet browsing software effectively. Introduction to the organization of library materials. Covers formal systems for description, access and subject cataloging including AACR2, MARC, Dewey Decimal classification, Library of Congress Classification and subject headings. Saye, Greenberg, Wisser.

523 DATABASE SYSTEMS 1: INTRODUCTION TO DATABASES (3). Pre- or corequisite, INLS 261 or 461. Design and implementation of basic database systems. Semantic modeling, relational database theory, including normalization, indexing and query construction, SQL. Blake.

525 ELECTRONIC RECORDS MANAGEMENT (3). Introduces the principles of records center design, records analysis and appraisal, filing systems, reprographics and forms, reports and correspondence management. Legal issues and the security of records are also covered. Lee.

530 YOUNG ADULT LITERATURE AND RELATED MATERIALS (3). A survey of print and nonprint library materials particularly suited to the needs of adolescents. Sturm, Hughes-Hassell.

532 CHILDREN'S LITERATURE AND RELATED MATERIALS (3). Survey of literature and related materials for children with emphasis on 20th-century authors and illustrators. Sturm.

534 ISSUES FOR CHILDREN AND TECHNOLOGY (3). This course will encourage students to explore the array of technologies available to children and adolescents, the issues surrounding their use, the role of caregivers and potential impacts on development. Sturm.

550 HISTORY OF THE BOOK AND OTHER INFORMATION FORMATS (3). The history of the origin and development of the book in all its formats: clay tablets to electronic. Coverage includes scientific and other scholarly publications, religious works, popular literature, periodicals and newspapers. Saye.

551 HISTORY OF LIBRARIES AND OTHER INFORMATION-RELATED CULTURAL INSTITUTIONS (3). The history of cultural institutions related to information from earliest times to the present day. Includes specific institutions, trends in service and facilities, and individuals important in the development of these institutions. Saye, Wisser

554 CULTURAL INSTITUTIONS (3). This course will explore cultural institutions—libraries, museums, parks, zoological and botanical gardens, reconstructions and other settings—as lifelong educational environments. Carr.

556 INTRODUCTION TO ARCHIVES AND RECORDS MANAGEMENT (3). Survey of the principles, techniques and issues in the acquisition, management and administration of records, manuscripts, archives and other cultural and documentary resources in paper, electronic and other media formats. Tibbo, Lee.

558 PRINCIPLES AND TECHNIQUES OF STORYTELLING (3). An overview of storytelling, its historical development and the presentation and administration of storytelling programs. The class focuses on performance skills merged with theoretical issues. Sturm.

560 NON-NUMERIC PROGRAMMING FOR INFORMATION SYSTEMS APPLICATIONS (3). An introduction to computer programming for library operations and information retrieval applications. Losee.

566 INFORMATION SECURITY (3). Prerequisite, INLS 461. Aspects of data integrity, privacy and security from several perspectives: legal issues, technical tools and methods, social and ethical concerns and standards. Meyers.

572 WEB DEVELOPMENT I (3). Prerequisite, INLS 261 or 461. Introduction to Internet history, architecture and applications. Introduces design

principles for creating usable and accessible Web sites. Develops technical skills and an understanding of standards. Kelly.

574 INTRODUCTION TO LOCAL AREA NETWORKS (3). Prerequisite, INLS 261 or 461. Introduction to local area network hardware, topologies, operating systems and applications. Also discusses LAN management and the role of the network administrator. Staff.

576 DISTRIBUTED SYSTEMS AND ADMINISTRATION (3). Prerequisite, INLS 461. Distributed and client/server-based computing. Includes operating system basics, security concerns and issues and trends in network administration. Hays.

578 PROTOCOLS AND NETWORK MANAGEMENT (3). Prerequisite, INLS 461. Network protocols and protocol stacks. Included are discussions of protocol classes, packet filtering, address filtering, network management and hardware such as protocol analyzers, repeaters, routers and bridges. Staff.

582 SYSTEMS ANALYSIS (3). Introduction to the systems approach to the design and development of information systems. Methods and tools for the analysis and modeling of system functionality (e.g., structured analysis) and data represented in the system (e.g., object-oriented analysis) are studied. (Undergraduates are encouraged to take INLS 382 instead of this course.) Haas, Wildemuth.

584 INFORMATION ETHICS (3). An overview of ethical reasoning, followed by discussion of issues most salient to information professionals, e.g., intellectual property, privacy, access/censorship, effects of computerization and ethical codes of conduct. Wildemuth.

585 MANAGEMENT FOR INFORMATION PROFESSIONALS (3). An introduction to general management principles and practices intended for information professionals working in all types of organizations. Topics include planning, budgeting, organizational theory, staffing, leadership, organizational change and decision making. Daniel, Moran,Wilkins-Jordan.

623 DATABASE SYSTEMS II: INTERMEDIATE DATABASES (3). Prerequisites, INLS 382 or 582, and 523 or proof of equivalency. Intermediate-level design and implementation of database systems, building on topics studied in INLS 523. Additional topics include MySQL, indexing, XML and nontext databases. Haas, Hemminger.

672 WEB DEVELOPMENT II (3). Prerequisites, INLS 572 and permission of the instructor. Study of design and implementation of dynamic Web pages and applications using both client and server side configuration and programming. Example topics include PHP, Ruby on Rails and Javascript. Kelly.

696 STUDY IN INFORMATION AND LIBRARY SCIENCE (1-3, repeatable). Prerequisite, permission of the instructor. Study by an individual student on a special topic under the direction of a specific faculty member. Six credit maximum for master's students. Graduate faculty.

Courses for Graduates

701 INFORMATION RETRIEVAL SEARCH STRATEGIES (3). Prerequisite, INLS 501 or INLS 509. Investigates information retrieval techniques and strategies from the world of electronic information sources, including commercial and Internet databases and search engines. Data analysis, marketing and end-user products and services are explored. Morisseau.

703 SCIENCE INFORMATION (3). Prerequisite, INLS 501. Survey of the communication of scientific information and the information sources in the physical and biological sciences; emphasis on major bibliographic and fact sources, including online reference services. Staff.

704 HUMANITIES AND SOCIAL SCIENCES INFORMATION (3). Prerequisite, INLS 501. Survey of information and its needs in the social sciences and humanities, with an emphasis on information use and search strategies and on reference and other information resources. Carr.

705 HEALTH SCIENCES INFORMATION (3). Prerequisite, INLS 501. A survey of information used in the health sciences disciplines and professions: The organization of sources, current techniques and tools for its control, including online databases. Gollop.

706 BIOMEDICAL INFORMATICS RESEARCH REVIEW (1). Develops understanding of information/library science research issues related to biomedical and health informatics through the review of journal articles, invited talks and critical group discussions. Hemminger.

707 GOVERNMENT DOCUMENTS (3). Prerequisite, INLS 501. A survey of the major publications of the United States federal government, United Nations, United States governments and British government, with attention to the selection, classification and administration of a document collection. Van Fossen.

708 LAW LIBRARIES AND LEGAL INFORMATION (3). Prerequisite, INLS 501. An introduction to the legal system and the development of law libraries, their unique objectives, characteristics and functions. The literature of Anglo-American jurisprudence and computerized legal research are emphasized, as well as research techniques. Kleinfelter, Bernstein.

709 BUSINESS INFORMATION (3). Prerequisite, INLS 501. Combines an introduction to basic business concepts and vocabulary with consideration of current issues in business librarianship and of key print and electronic information sources. Neilson.

714 MANAGING SERIALS IN AN ELECTRONIC AGE (3). Prerequisites, INLS 501 and INLS 521. Survey of technical and public services aspects of serials management, including publishing, acquisition, collection development, organization, cataloging, licensing, access and preservation of print and electronic serials. Lamoureux.

715 USER PERSPECTIVES IN INFORMATION SYSTEMS AND SERVICES (3). Explores the roles of information in human activity. Resulting insights are directed toward design of user-oriented systems. Psychological, social, economic, political, task and other situational perspectives are taken. Wildemuth.

718 USER INTERFACE DESIGN (3). Prerequisite, INLS 582. Basic principles for designing the human interface to information systems, emphasizing computer-assisted systems. Major topics: users' conceptual models of systems, human information processing capabilities, styles of interfaces, evaluation methods. Wildemuth.

720 METADATA ARCHITECTURES AND APPLICATIONS (3). Prerequisite, INLS 520, 521 or 509. Examines metadata in digital environment. Emphasizes the development and implementation of metadata schemas in distinct information communities and the standards and technological applications used to create machine understandable metadata. Greenberg.

721 ORGANIZATION OF MATERIALS II (3). Prerequisite, INLS 521. Principles, practices and future trends in the organization of library resources. Includes: classification; subject indexing; MARC format; Library of Congress rule interpretations; and cataloging of print, nonprint, computer and Internet resources. Saye.

723 DATABASE SYSTEMS III: ADVANCED DATABASES (3). Prerequisite, INLS 623. Advanced study of database systems. Topics include database design, administration, current issues in development and use, optimization, indexing, transactions and database programming. Chaffin, Haas.

724 ABSTRACTING AND INDEXING FOR INFORMATION RETRIEVAL (3). Prerequisite, INLS 261, INLS 461, INLS 520, or INLS 521. Examines abstracting, indexing and classification principles and techniques for document and object (nontextual materials) analysis. Human and automated techniques are covered. Greenberg.

733 ADMINISTRATION OF PUBLIC LIBRARY WORK WITH CHILDREN AND YOUNG ADULTS (3). Objectives and organization of public library services for children and young adults; designed for those who may work directly with young people or who intend to work in public libraries. Sturm.

739 INFORMATION SERVICES AND SPECIFIC POPULATIONS (3). Service, professional and administrative issues related to information access by

nontraditional information service users. The course examines trends, public policy, ethical issues, programming and evaluation of services. Gollop.

740 DIGITAL LIBRARIES: PRINCIPLES AND APPLICATIONS (3). Research and development issues in digital libraries including: collection development and digitization, mixed mode holdings; access strategies and interfaces, metadata and interoperability, economic and social policies, and management and evaluation. Marchionini.

744 THE SCHOOL LIBRARY MEDIA CENTER (3). Philosophy and mission of the school library media center in context of the educational environment. Considers program planning and evaluation, policy development and examination of current issues. Hughes-Hassell.

745 CURRICULUM ISSUES AND THE SCHOOL LIBRARIAN (3). Considers the educational process, methods of teaching, scope and sequence of curricular content in grades K–12. Examines the role of the library media specialist in providing access, instruction and consultation. Hughes-Hassell.

746 MUSIC LIBRARIANSHIP (3). Survey of the history and practice of music librarianship, with an emphasis on administration, collection development and public service in academic and large public libraries. Staff.

747 SPECIAL LIBRARIES AND KNOWLEDGE MANAGEMENT (3). Prerequisite, INLS 585. Professional competencies required to work as a special librarian or knowledge manager in a corporate or nonprofit setting. Strategic planning. Organizational dynamics. Tailoring services. Intranet design. Value-added measures. Intellectual capital. Daniel, Vargha.

748 HEALTH SCIENCES ENVIRONMENT (3). Prerequisite, INLS 501, INLS 585 or permission of the instructor. Trends in health care delivery, biomedical research and health sciences education, with emphasis on the impact and use of information. Includes observation of clinical and research settings. Gollop, Marshall.

752 DIGITAL PRESERVATION AND ACCESS (3). Focuses on best practices for the creation, provision and long-term preservation of digital entities. Topics include digitization technologies; standards and quality control; digital asset management; grant writing; and metadata. Tibbo.

753 PRESERVATION OF LIBRARY AND ARCHIVE MATERIALS (3). An introduction to current practices, issues and trends in the preservation of materials for libraries and archives, with an emphasis on integrating preservation throughout an institution's operations. Doyle.

756 ADVANCED ISSUES AND PRACTICES IN ARCHIVES AND MANUSCRIPTS ADMINISTRATION (3). Prerequisite, INLS 556 or equivalent. Examines issues in the administration of archival, manuscripts and records programs. Explores how theory relates to professional practice. Tibbo.

758 INTERNATIONAL AND CROSS-CULTURAL PERSPECTIVES FOR INFORMATION MANAGEMENT (3). Examines information in society for selected nations/cultures. Compares institutions, processes and trends in the globalization of information management in the face of barriers of language and culture. Daniel, Moran.

760 WEB DATABASES (3). Prerequisites, INLS 572 or equivalent, INLS 623 or equivalent, and programming experience. Explores concepts and practice surrounding the implementation and delivery of Web-enabled databases. Students will gain experience with and evaluate PC and Unix Web database platforms. Staff.

762 INTERNET ISSUES AND FUTURE INITIATIVES (3). Prerequisite, INLS 572 or equivalent. Members of this seminar discuss emerging Internet policy issues such as copyright, intellectual property, privacy and security. Participants will also explore emerging Internet tools and applications. Jones.

780 RESEARCH METHODS (3). Prerequisites, completion of 12 credit hours, INLS 500 and either INLS 501 or INLS 509. An introduction to research methods used in library and information science. Includes the writing of a research proposal. Kelly, Losee.

782 INFORMATION SYSTEMS EFFECTIVENESS (3). Prerequisite, INLS 780 recommended. Addresses issues of performance measurement and methodology in the evaluation of information systems and services. The roles of objectives, performance measures, data collection approaches and analytical approaches will be considered. Wildemuth.

785 HUMAN RESOURCES MANAGEMENT (3). Prerequisite, INLS 585. An in-depth look at the management of human resources in libraries and other information agencies. Includes topics such as recruitment, hiring, job analysis, performance appraisal, training and compensation. Moran.

786 MARKETING OF INFORMATION SERVICES (3). Application of marketing theory to libraries and other information settings. Includes consumer behavior, market research, segmentation, targeting and positioning, public relations, product design and sales promotion. Daniel.

788 USER EDUCATION (3). Prerequisite, INLS 501, INLS 500 or permission of the instructor. Examines the history and context of LIS training programs. Pedagogy, teaching skills, methods of evaluation are addressed. Students may tailor learning projects to their own interests. Daniel.

795 SUPERVISED FIELD EXPERIENCE (3). Prerequisites, completion of 21 semester hours and permission of advisor. Supervised observation and practice in an information service agency or library. The student will work a required amount of time in the work setting under the supervision of an information/library professional, and will participate in faculty-led group discussions for ongoing evaluation of the practical experience. Daniel.

802 SEMINAR IN INFORMATION RETRIEVAL (3). Prerequisites, INLS 509 and doctoral student status or permission of the instructor. A seminar on the basic questions that arise in information retrieval research and the methods and theories that enable observation, analysis and interpretation. Staff.

818 SEMINAR IN HUMAN-COMPUTER INTERACTION (3). Prerequisite, INLS 718 or permission of the instructor. Research and development in design and evaluation of user interfaces that support information seeking. Major topics: interactivity, needs assessment, query and browser interactions, interactive design and maintenance, usability testing. Marchionini.

841 SEMINAR IN ACADEMIC LIBRARIES (3). Prerequisite, INLS 585. Study of problems in the organization and administration of college and university libraries with emphasis on current issues in personnel, finance, governance and services. Moran.

842 SEMINAR IN POPULAR MATERIALS IN LIBRARIES (3). Selected topics relating to the roles of various types of libraries in the provision and preservation of popular materials (light romances, science fiction, comic books, etc.) existing in various forms (print, recorded sound, etc.). Moran.

843 SEMINAR IN PUBLIC LIBRARIES (3). Prerequisite, completion of 12 semester hours. Selected topics in public library services, systems, networks and their management. Current issues are emphasized, along with the interests of the participants. Gollop.

857 SEMINAR IN RARE BOOK COLLECTIONS (3). A study of the nature and importance of rare book collections; problems of acquisition, organization and service. McNamara.

859 SEMINAR IN INFORMATION AND CULTURE (3). Explorations of scholarship and observations about information and its social appearances in contemporary culture. Reading, literacy and cultural values will be emphasized. Carr.

881 RESEARCH ISSUES AND QUESTIONS I (3). Prerequisite, doctoral status or permission of the instructor. Intensive and systematic investigation of the fundamental ideas in information and library science. Exploration and discussion in seminar format. Must be taken in fall semester followed by INLS 882 in spring. Fall. Graduate faculty.

882 RESEARCH ISSUES AND QUESTIONS II (3). Prerequisite, doctoral status or permission of the instructor. Intensive and systematic investigation of the fundamental ideas in information and library science. Exploration and

discussion in seminar format. Must be taken in the spring semester immediately after INLS 881 (offered fall only). Spring. Graduate faculty.

883 RESEARCH COLLOQUIUM (1). Prerequisite, doctoral student status. Presentation and discussion of research issues, questions, methods, analytical approaches by students, faculty or visitors.

885 SEMINAR IN COMMUNICATION (3). Prerequisite, doctoral student status or permission of the instructor. A seminar on the basic questions that arise in communication research and the methods and theories that enable observation, analysis and interpretation. Staff.

887 SEMINAR IN THEORY DEVELOPMENT (3). Prerequisite, doctoral or advanced master's student status. Discussion and critique of the structural components and processes utilized in theory development. Seminar provides knowledge relating to the various stages of theory building. Staff.

888 SEMINAR IN TEACHING AND ACADEMIC LIFE (3). Prerequisite, doctoral student or advanced master's student status. Examines teaching, research, publication and service responsibilities. Provides perspective on professional graduate education and LIS educational programs. Explores changing curricula and discusses ethics, rewards and problems of academic life. Staff.

889 SEMINAR IN TEACHING PRACTICE (1). Prerequisites or corequisites: doctoral student status, INLS 888. For doctoral students currently involved in teaching activities, these regular seminar meetings are designed to discuss relevant literature and aspects of the teaching experience. Staff.

890 ADVANCED SELECTED TOPICS (1–6). Exploration of an advanced special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict their future availability; new courses may replace these.

988 RESEARCH IN INFORMATION AND LIBRARY SCIENCE (1–6, repeatable). Prerequisite, permission of the instructor. Supports individual and small group research undertaken by doctoral students in information and library science intended to produce research results of publishable quality. Staff.

992 MASTER'S PAPER (3). Provides a culminating experience for master's degree students, who engage in independent research or project effort and develop a major paper reporting the research or project under the supervision of a faculty member. Staff.

994 DOCTORAL DISSERTATION (3 or more). Staff.

School of Journalism and Mass Communication

www.jomc.unc.edu
JEAN FOLKERTS, *Dean*

Professors

Penelope Muse Abernathy, Knight Chair in Journalism. Digital Media, Economics
Jane D. Brown (28) James L. Knight Professor. Mass Media Uses and Effects, Health Communication, Qualitative Methods
Richard R. Cole (18). John Thomas Kerr Jr. Distinguished Professor. International Communication, Professional Journalism, Mass Communication and Society
Anne M. Johnston (50) Associate Dean for Graduate Studies. Media Effects, Women and Media, Political Communication
Thomas R. Linden (58) Glaxo Wellcome Distinguished Professor or Medical Journalism. Medical Journalism
Daniel Riffe, Richard Cole Eminent Professor. Media Processes and Production
Donald L. Shaw (23) Kenan Professor. U.S. Newspaper History, Agenda Setting
Richard H. Simpson (52) Broadcast and Corporate Production
Dulcie Straughan (36) Senior Associate Dean. Public Relations
John Sweeney (46) Distinguished Professor in Sports Communication. Advertising, Sports Marketing
D. Leroy Towns, Professor of the Practice; Research Fellow, Program on Public Life.
Charles A. Tuggle (59) Broadcast Journalism
Ruth Walden (33). James Howard and Hallie McLean Parker Distinguished Professor. First Amendment Theory, Media Law and Ethics
Jan Yopp (42). Dean, Summer School; Walter Spearman Professor. News-Editorial Journalism, Public Relations
Xinshu Zhao (47) Advertising and Political Communication in the United States and China

Associate Professors

Debashis Aikat (55) Media Technology
Lois Boynton (61) Public Relations, Ethics
George W. Cloud (41) News-Editorial Journalism
Patrick Davison (62) Visual Communication
Frank Fee (60) Public Journalism, Newspapers, Media History, Media Management
Rhonda Gibson (63) Print Journalism, Minorities and Media, Mass Communication Theory
Joe Bob Hester (64) Associate Dean for Undergraduate Studies. Advertising
Michael Hoefges (70) Mass Communication Law, Advertising Law, Freedom of Information and Access Law, Privacy Issues
Sriram Kalyanaraman (66) New Media and Media Effects
Cathy Packer (37) Mass Communication Law
Chris Roush (67) Walter E. Hussman Sr. Distinguished Scholar in Business Journalism; Business Journalism Director, Carolina Business News Initiative; News-Editorial Journalism; Business Reporting
Lucila Vargas (53) International/Development Communication, Women and Media, Qualitative Methods

Clinical Associate Professor

Paul Jones (74) Director of ibiblio.org. Internet Issues and Applications (Digital Libraries, Electronic Publishing, Online News, Virtual Communities, Legal and Social Issues Relating to Networked Information and Access)

Assistant Professors

Andy Bechtel (77) News-Editorial Journalism, Media Ethics
Napoleon Byars (78) News-Editorial Journalism, Public Relations
Queenie Byars (84) News-Editorial Journalism
Alberto Cairo (79) Visual Communication
Francesca Carpentier (80) Broadcast Journalism
Craig Carroll (85) Public Relations
Paul Cuadros (86) News Reporting
David Cupp (81) Broadcast Journalism
Elizabeth Dougall (69) Public Relations
Barbara Friedman (71) News-Editorial Journalism, Media History
Heidi Hennink-Kaminski (82) Advertising, Social Marketing
Dana McMahan, Advertising
Laura Ruel (73) Visual Communication
Janas Sinclair (74) Advertising
Ryan Thornburg (87) News-Editorial Journalism
Don Wittekind (83) Visual Communication

Lecturers

Ferrel Guillory, Director, Program on Southern Politics and Media and Public Life. Politics and the Media
Jock Lauterer, Director, Carolina Community Media Project. Community Journalism, News-Editorial Journalism

Professors Emeriti

John B. Adams
Harry Amana
Richard J. Beckman
Thomas A. Bowers
A. Richard Elam

Robert F. Lauterborn
Raleigh Mann
Philip Meyer
James J. Mullen
Carol Reuss
Chuck Stone

The School of Journalism and Mass Communication offers programs leading to the master of arts in mass communication and the doctor of philosophy in mass communication.

Admission

Applications are available via the Web through gradschool.unc.edu. Completed forms are submitted to The Graduate School, whose admissions decisions are based largely on recommendations from the School of Journalism and Mass Communication. The minimum criteria for admission to a graduate program in journalism and mass communication are:

- A recognized undergraduate degree (or equivalent credential from a foreign university)
- A recognized master's degree, in addition, if applying for the Ph.D. program
- An undergraduate cumulative GPA of at least 3.0 (A = 4.0)
- Graduate Record Examination (GRE) scores of at least the 55th percentile on the verbal section, 50th percentile on the quantitative section and 4.5 on the analytical writing section
- Three letters of recommendation. Forms can be found in the online application
- A statement of career intent, indicating how the applicant intends to use graduate education in journalism and mass communication
- A current résumé
- A writing sample. For master's applicants, this could be an academic paper or magazine or newspaper article; for doctoral applicants, a chapter from their master's thesis or a copy of an academic paper
- Ph.D. applicants must also include a separate statement that details a problem that they would like to solve during their time as a doctoral student. Applicants are not committed to researching this problem if accepted into the program, but the School of Journalism wants to know their research interests

In addition, international applicants must submit Test of English as a Foreign Language (TOEFL) scores and the financial certificate as required by The Graduate School

Applicants should be aware that the number of applications far exceeds the number of spaces available, and that many qualified applicants must be rejected because of limited space in the program.

New students are admitted only for the fall semester. The application deadline is January 1 for the following fall.

Financial Assistance

Roy H. Park Fellowships are available to eight new doctoral students and 14 incoming master's students each year. These fellowships provide handsome stipends, payment of tuition and fees, health insurance and money for research and travel to professional and academic conferences. The stipend for doctoral students each year is $20,500, and master's students receive a $14,000 annual stipend. Doctoral student funding is for three years, and master's student funding lasts for two years. Continuation of funding beyond the first year is dependent on satisfactory progress in the program. In return for this funding, doctoral and master's students must work as graduate assistants. These are 15-hour work weeks, and assignments vary according to the needs of the faculty and interest and skill levels of the students. The Roy H. Park Fellowships are available only to United States citizens. There is no special application for these fellowships. All U.S. citizens qualified for admission to the program are considered for Roy H. Park Fellowships. Fellowship finalists will be invited to participate in on-campus interviews in February or March.

Other financial assistance available for graduate students includes the Richard Cole Eminent Professor Graduate Fellowship, which provides the same level of funding with the same work requirement as the Roy H. Park Ph.D. Fellowships; the Pfizer Minority Medical Journalism Scholarship, which provides four semesters of support ($6,000 scholarship per semester—no work requirement, tuition and health insurance) for a master's student in the medical journalism program with demonstrated financial need; the Peter DeWitt Pruden Jr. and Phyllis Harrill Stancill Pruden Fellowship, which provides the same level of funding with the same work requirement as the Roy H. Park Fellowships; and the Graduate Dean's Research Assistantship (work requirement of 15 hours per week), awarded each year to an incoming master's student with an interest in print journalism or public relations. The school also offers the William F. Clingman Award ($4,000–$8,000) for the study of ethics to continuing students and the $1,000 Tom Wicker Scholarship to continuing master's students interested in news-editorial careers. In addition, limited funds for dissertation or thesis research are available through the Minnie S. and Eli A. Rubinstein Awards.

Any graduate student who receives any funding for his or her education from a school-based source is required to maintain at least a P average each year. This applies to both master's and doctoral students. Grades are reviewed each spring in order to make this determination. L grades must be balanced by H grades in order to maintain this average. If a student gets an L in one of the core courses, he or she must pass a comprehensive examination given during the following semester. If the student fails the exam, he or she will be allowed to retake the course once. The student cannot have the first L removed from his or her transcript by passing the examination or by getting a P upon retaking the course. If the student again earns an L after retaking the course, he or she will not be allowed to continue in the program.

The Master's Program

The master's program has two major sequences. The professional sequence is designed to educate students for professional careers in public relations, advertising, journalism and other mass communication fields. The mass communication sequence gives students the background needed for teaching or research. In both sequences, students are taught to critically examine the role of mass communication in society and are provided with a firm grounding in theory and analysis. By setting high standards for both scholarly and professional achievement, the school seeks to prepare graduates to be leaders and critical thinkers, no matter what career paths they might take.

The M.A. is designed to meet the needs of 1) holders of the bachelor's degree in fields other than journalism-mass communication who wish to enter the field, 2) journalists who want more education in a specialized field, 3) experienced journalists or communicators who wish to prepare themselves for teaching, 4) individuals primarily interested in education for media research and 5) journalism-mass communication graduates who wish to continue their education and career development.

In other words, this is not strictly a professional master's program that aims to teach technical skills in writing, editing, photography and graphic design. Nor is the focus solely academic and theoretical. Rather,

the school seeks to achieve a balance.

Path Options

Early in the program, each master's student, with his or her advisor, designs a path of courses that leads to a coherent goal. The path is usually determined by a career interest and includes courses numbered 400 and above both inside and outside the school. Students in the professional sequence take at least one 800-level seminar, and those in the mass communication sequence take two seminars. All of the path courses are evaluated for consistency with the thesis, series of articles or project that the student does as the capstone for the M.A. work. All students must take a research methods course appropriate to the capstone thesis or nontraditional thesis option.

Some examples of paths in the professional sequence:

- Students preparing for careers leading to management and research positions in advertising may choose courses in advertising management and planning, research, new technologies, sales or some other area. Courses from business, psychology, sociology and information and library science are suggested as outside courses.
- For careers in writing and editing for the print media, students choose courses that teach the relevant skills. Students also learn the theory and analytical skills needed to eventually hold leadership positions in their chosen fields.
- Public relations students prepare for careers leading to management positions in corporations, nonprofit organizations, government or public relations agencies. Their paths include skills and theory courses in public relations as well as outside areas of interest, including business, organizational and speech communication, and health communication.
- Other fields for which professional paths can be designed include visual communication, electronic communication, online journalism and multimedia.
- Paths in the mass communication sequence can be just as diverse. Students learn the theory and research methods that they need to teach at a small college or to pursue a doctorate in mass communication. They can study mass communication law or history, media effects, new communication technologies, or international communication, among other subjects. Depending on the course of study they select, they may also be prepared for a variety of research positions in the public and private sectors. Students in this sequence do not take professional skills courses such as news writing and editing.

Requirements

Master's students must earn at least 30 graduate-level credits (10 courses numbered 400 or above) including three credits for a thesis or nontraditional thesis option. Course requirements are divided into three categories: basic competencies, core courses and path courses. At least six courses (including the thesis or thesis option) must be numbered 700 or above. This includes a research methods course, generally JOMC 703 or 704, appropriate to the thesis or nontraditional thesis option. Two to four of the graduate-level courses should be taken from other University departments. Students may select from courses offered by other departments or schools at UNC-Chapel Hill, Duke University and North Carolina State University.

Basic Competencies: All master's students must pass the school's spelling and grammar test by the end of the first semester. This exam is a basic requirement for graduation for our undergraduate students and normally poses no major problems for graduate students. Information on the spelling and grammar test, including instructions on how to study for it, is included in the orientation packet sent to new students each summer.

Master's students must also demonstrate competency in basic skills related to their chosen paths. For example, students interested in careers in print media must take Reporting and Writing News (JOMC 753) as one of their competency courses, plus two other courses in related areas, such as editing, graphic design or feature writing. Students interested in public relations careers must take Public Relations Foundations (JOMC 730) as one of their competency courses, plus two other related courses. Regardless of sequence, three competency courses are required, and no credit is given toward the degree. Competency courses can be at any level, including undergraduate (300 and below).

Core Courses: All master's students must take Mass Communication Research Methods (JOMC 701) and Mass Communication Law (JOMC 740). Master's students in the mass communication sequence must also take Theories of Mass Communication (JOMC 705).

If a student receives an L in any core course, he or she must pass a comprehensive examination given during the second semester. If the student fails the exam, he or she must retake the course the following fall. If the student again makes an L, he or she will not be allowed to continue in the program.

Path courses: The master's program is designed to allow students, under the direction of their advisors, to design a course of study, or a path, that addresses their research and skills interests. This path may follow traditional sequence lines (i.e., advertising, news-editorial, public relations) or integrated to provide a more convergent program of study (i.e., integrated marketing communications or strategic communications). Regardless of the sequence or path, each student must define a coherent theme connecting courses in the School of Journalism and Mass Communication and those outside the school. Those courses must be appropriate to the thesis or nontraditional thesis option. Students planning to write a series of articles as their thesis option must take Specialized Reporting (JOMC 754) as a path course.

All students must pass the appropriate examinations, which include a comprehensive written examination covering the material in the student's path courses (given at the completion of course work), and an oral examination on the thesis or professional project, given by the student's advisory committee.

M.A. students must complete the degree within five years of admission to the program. Students who do not finish within five years may petition for an extension.

Thesis, Articles or Project

In the mass communication sequence, students must do a traditional research thesis. In the professional sequence, students have the option of writing a thesis or presenting a professional-quality series of articles (JOMC 993) or project (JOMC 992). The series of articles or project requires the same effort and professionalism as the traditional thesis. In addition to the professional product itself, the nontraditional thesis option requires an extensive review of the literature and statement of methods.

Students enroll in Master's Thesis, JOMC 993, or Nontraditional Thesis Option, JOMC 992, for three credits as they do the thesis, articles or project. A maximum of three thesis credits can be counted toward the 30 credits required for the M.A.

Length of Program

Most students complete the master's program in two years, typically attending classes full-time during three consecutive semesters and completing the thesis, articles, or project in the fourth semester. Some students find it necessary to stay the summer after their second year to complete their theses, articles or special projects. Although it is possible to complete the degree by taking classes part time, the school does not recommend it and generally admits no more than one part-time M.A. student per year.

Graduate Committee

To gain the most from the program, students should select a three-member advisory committee early. Led by a member of the school's graduate faculty who serves as the student's advisor, the committee acts as a resource as well as referee of the thesis, articles or special project. One member of the committee should be a faculty member from outside the school with whom the student has taken a course.

Master of Arts with a Concentration in Medical Journalism

The aim of the master of arts with a concentration in medical journalism is to teach the skills needed to work as a medical journalist in both print and electronic media. Students will also gain the knowledge and background necessary to pursue further research in medical journalism.

Requirements

Master's students in medical journalism must earn at least 30 graduate-level credits (10 courses numbered 400 or above) including three credits for a thesis or special project. Course requirements are divided into five categories: basic journalism and mass communication competencies, core medical journalism courses, related public health and other pertinent courses, core journalism and mass communication courses, and advanced journalism and mass communication courses.

Basic Competencies: All master's students must pass the school's spelling and grammar test by the end of their first semester. This is a basic requirement for graduation for undergraduate students and normally poses no major problem for graduate students. Information on the spelling and grammar test, including instructions on how to study for it, is included in the orientation packet sent to new students each summer.

Medical journalism students must also demonstrate competency in other basic skills related to their career goals. For example, students interested in careers in print media must demonstrate competency in newswriting and editing, plus one related area such as reporting, photography, graphic design or feature writing. Students preparing for broadcast careers must demonstrate competency in writing for electronic media and two other relevant areas, such as video production and editing, electronic journalism or television news production. For all students, three competency courses are required, and no credit toward graduation is given for those courses. Competency courses can be at any level, including undergraduate (300 and below). Occasionally students may instead pass exemption exams, which usually are given during orientation.

Core Medical Journalism Courses: Students must take JOMC 560, Medical Journalism. After successfully passing JOMC 560, students must then take JOMC 561, Medical Reporting for the Electronic Media.

Related Public Health and Other Pertinent Courses: All master's students in the medical journalism program must take three courses outside the School of Journalism and Mass Communication:

- EPID 600, Principles of Epidemiology AND
- HPAA 564, Organization, and Financing of the U.S. Health System
- PLUS a third course outside the School of Journalism and Mass Communication approved by the director of the medical journalism program.

Core Journalism and Mass Communication Courses: JOMC 701, Mass Communication Research Methods, and JOMC 740, Mass Communication Law. If the student makes an L in either course, he or she must pass a comprehensive examination during the second semester. If the student fails the exam, he or she must retake the course. If the student again receives an L, he or she will not be allowed to continue in the program.

Advanced Journalism and Mass Communication Courses: Students must also take at least one more JOMC 400-level or above course and one JOMC 800-level seminar. Students planning to write a series of articles as their thesis option must take Specialized Reporting (JOMC 754) to fulfill the additional 400-level or above JOMC course requirement.

All students must pass the appropriate examinations, which include a comprehensive written examination covering the material in the student's path courses, given at the completion of course work, and an oral examination on the thesis or professional project, given by the student's advisory committee.

Thesis, Project or Articles

Master's students in medical journalism have the option of writing a traditional thesis or a series of articles (JOMC 993) or doing a non-traditional thesis project (JOMC 992). Examples of projects include preparing a broadcast-quality television or radio report, or preparing a medical journalism multimedia project.

Length of Program

Students will complete the master's program in two years by attending classes full-time during the first three consecutive semesters and then completing the thesis or project during the fourth semester. There is no provision for part-time students in the master's program in medical journalism.

Graduate Committee

Students select a three-member advisory committee. Headed by the director of the medical journalism program or another appropriate professor who serves as the student's advisor, the committee acts as a resource as well as a referee of the thesis or project. One member of the committee should be from outside the school, preferably from a health- or science-related discipline with whom the student has taken a course.

Ph.D. Program

The Ph.D. in mass communication is designed to prepare students for college teaching and research positions or research careers in mass communication industries, advertising agencies, market or opinion research firms, business or government. The school works closely with each student to develop a program of study that is both interdisciplinary, allowing the student to take full advantage of the University's rich academic offerings, and tailored to meet the specific needs and interests of the student. The goal of the program is to produce outstanding scholars who are highly knowledgeable about mass communication and highly skilled as researchers.

The program is small and very selective; 10 to 12 students are admitted each year. Admissions decisions are based not only on the standard criteria described elsewhere in this catalog—GRE scores, grade averages, and letters of recommendation—but also on a determination of

whether the applicant's interests and goals fit with those of the program and faculty. For that reason, the statement of purpose and statement of research interests that must accompany an application are extremely important, and applicants are encouraged to be as specific as possible in outlining their research interests and career goals.

Requirements

Ph.D. students are required to develop 1) a broad understanding and knowledge of mass communication in modern society, 2) expertise in two areas of specialization in mass communication and 3) competence in an appropriate research methodology. Students have considerable flexibility in designing their programs around a core of four courses, which should be taken during the first year of study. The four core courses are Mass Communication Research Methods (JOMC 701), Readings in Mass Communication History (JOMC 742), Theories of Mass Communication (JOMC 705) and Mass Communication Law (JOMC 740). If a student receives an L in any core course, he or she must pass a comprehensive examination given during the second semester. If the student fails the exam, he or she must retake the course the following fall. If the student again makes an L, he or she will not be allowed to continue in the program.

Forty-eight graduate credits (400-level and above courses), in addition to at least six dissertation credits, are required for the Ph.D. Those 48 hours must be arrayed into three groups of courses: two substantive areas of specialization, a primary area consisting of at least 15 credits and a secondary area consisting of at least nine credits; and research methods consisting of at least four courses. Major and minor substantive areas should be selected from the list of approved substantive areas of study set by the program. The research methods that a student chooses to study must be appropriate to the student's areas of specialization and dissertation topic.

Other requirements include

- At least eight courses, totaling at least 24 credits, of 700-, 800- and 900-level courses within the School of Journalism and Mass Communication
- Satisfactory performance on written and oral comprehensive exams
- At least four semesters in residence, with a minimum of two semesters in continuous study at UNC-Chapel Hill;
- Satisfactory performance on written and oral comprehensive exams. Students must take both written and oral exams at the end of their Ph.D. course work
- Successful completion and oral defense of a dissertation

Length of Program

Students normally spend two years taking courses, then take comprehensive exams very early in their third fall semester. They then write their dissertation proposals. After the proposal is approved by the student's doctoral committee, the dissertation must be completed and defended. The nature of the dissertation research will govern the length of time a student spends on the project, but many students find it takes about one year to complete a dissertation. In general, it takes three years, and often more, to complete the Ph.D. The Graduate School requires students to complete the degree within eight years of entry into the program. Students who do not finish within eight years may petition for an extension.

Doctoral Committee

Each Ph.D. student selects a five-member supervisory committee, which is approved by the associate dean for graduate studies. This committee consists of three School of Journalism and Mass Communication faculty members and two graduate faculty members from outside the school. The student's advisor serves as chair of the committee. The committee should consist of professors with whom the student has taken courses. The committee guides the student's academic development, administers and evaluates the comprehensive exams and approves the dissertation proposal and dissertation.

Courses for Graduates and Advanced Undergraduates

421 [121] ELECTRONIC JOURNALISM (3). Prerequisites, JOMC 120 and 121. Examination and application of in-depth broadcast news reporting techniques, especially hard news reporting and special events coverage. Cupp, Tuggle.

422 [122] PRODUCING TELEVISION NEWS (3). Prerequisites, JOMC 421 and permission of the instructor. Students work under faculty guidance to produce "Carolina Week," a television news program, and are responsible for all production tasks: producing, reporting, anchoring, directing and others. Tuggle.

423 [123] TELEVISION NEWS AND PRODUCTION MANAGEMENT (3). Prerequisites, JOMC 422 and permission of the instructor. Students participate in a collaborative learning environment to hone skills learned in earlier courses and help less-experienced students acclimate to the broadcast news experience within the school. By invitation only. Tuggle.

424 [124] ELECTRONIC MEDIA MANAGEMENT AND POLICY (3). Introduces management, station operation and economic and legal issues one might encounter while working in electronic media. Provides a background of electronic media organizations in addition to providing information needed to understand the policies under which media managers work. Carpentier.

425 VOICE AND DICTION (3). Designed to help students develop presentation skills and use voices effectively as professional broadcast journalists.

426 PRODUCING RADIO (3). Prerequisite, JOMC 121. Students work under faculty guidance to produce "Carolina Connection," a weekly 30-minute radio news program, and are responsible for all production tasks: producing, reporting, anchoring and editing.

427 STUDIO PRODUCTION FOR TELEVISION NEWS (3). Prerequisite, JOMC 120. This course is a project-based, hands-on studio production course with special focus on technical skill development and directing in a news environment.

428 BROADCAST HISTORY (3). A theoretical course designed to help students develop an understanding of and an appreciation for the role broadcast journalism has played in recent American history..

431 [131] CASE STUDIES IN PUBLIC RELATIONS (3). Prerequisite, JOMC 130. Analysis of public relations practices, including planning, communication and evaluation exercises, and management responsibilities.

433 CRISIS COMMUNICATION (3). Prerequisites, JOMC 130 and 431. Principles of effective crisis communication management are introduced, applied and practiced in this service-learning class. Students apply the concepts, theories and frameworks learned in the classroom by working with community partners to research, design and deliver crisis communication plans and media training.

434 [134] PUBLIC RELATIONS CAMPAIGNS (3). Prerequisite, JOMC 431 or 232. Capstone course that builds on concepts and skills from earlier courses. Students use formal and informal research methods to develop a strategic plan, including evaluation strategies, for a client. Curtin, Dougall, Kelleher, Lamb, Straughan.

441 [111] DIVERSITY AND COMMUNICATION (3). An examination of racial stereotypes and minority portrayals in United States culture and communication. Emphasis is on the portrayal of Native Americans, African Americans, Hispanics and Asian Americans in the mass media. Amana.

442 [115] WOMEN AND MASS COMMUNICATION (WMST 415) (3). An examination of gender as it relates to media producers, subjects and audiences with a focus on current practices and possibilities for change. Johnston, Vargas.

443 LATINO MEDIA STUDIES (3). An introductory course to the study of United States Latina/os and the media. It analyzes the media portrayal of Latina/os in United States mainstream media. The course also examines media that cater to Latina/os and explores the way in which Latina/o audiences use the multiple media offerings available to them.

445 [145] PROCESS AND EFFECTS OF MASS COMMUNICATION (3). Mass communication as a social process, incorporating literature from journalism, social psychology, sociology, political science and history. To acquaint students with factors in message construction, dissemination and reception by audiences. Brown, Kalyanaraman.

446 [146] INTERNATIONAL COMMUNICATION AND COMPARATIVE JOURNALISM (3). Development of international communication; the flow of news and international propaganda; the role of communication in international relations; communication in developing nations; comparison of press systems. Stevenson, Vargas.

448 [160] FREEDOM OF EXPRESSION IN THE UNITED STATES (3). An examination of the development of freedom of expression in the United States within the context of the nation's history. Staff.

449 BLOGGING, SMART MOBS AND WE THE MEDIA (3). For advanced undergraduates through Ph.D. students. Practical and theoretical approaches to understanding, designing, building and using virtual communities, including studies of network capital, social capital and social production.

450 [153] BUSINESS AND THE MEDIA (3) Role of media in United States society and effects on public perception of business. Relationship of business press and corporate America. Current issues in business journalism. Roush.

451 [151] ECONOMICS REPORTING (3). Prerequisite, JOMC 153. Coverage of Wall Street and the economy, including stocks, bonds and economic indicators. Reporting on the Federal Reserve, labor, consumer sector, manufacturing and inflation and certain industries. Roush.

452 [152] BUSINESS REPORTING (3). Prerequisite, JOMC 153. Methods and tactics of covering businesses for mass communication. Why and how companies operate and how to write stories about corporate news from public records and other sources. Roush.

453 [154] ADVANCED REPORTING (3). Prerequisite, JOMC 153 and 253. Rigorous, in-depth instruction and critiques of students' news and feature assignments done with different reporting methodologies: interviewing, official records, direct and participant observation and survey research (i.e., the Carolina Poll). Meyer, Tuggle.

456 [156] MAGAZINE WRITING AND EDITING (3). Prerequisites, JOMC 153 and 256. Instruction and practice in planning, writing and editing copy for magazines. Staff.

457 [157] ADVANCED EDITING (3). Prerequisite, JOMC 157. Concentration on the editing and display of complex news and feature stories and other print media content, with a significant emphasis on newspaper design and graphics. Bechtel, Cloud, Fee.

458 [158] SOUTHERN POLITICS: CRITICAL THINKING AND WRITING (3). News analysis with special attention to states of the American South and especially to elections. Social and economic trends, politics and government serve as raw material for interpretive journalism. Guillory.

459 [159] COMMUNITY JOURNALISM (3). Prerequisite, JOMC 153. Comprehensive study of the community press, including policies, procedures and issues surrounding the production of smaller newspapers within the context of the community in its social and civic setting.

471 [176] ADVANCED ADVERTISING COPYWRITING (3). Prerequisites, JOMC 271 and permission of the instructor. Rigorous, in-depth instruction and critiques of student advertising writing. Sweeney.

473 [173] ADVERTISING CAMPAIGNS (3). Prerequisites, JOMC 271 or 272. Planning and execution of advertising campaigns, types and methods of advertising research and the economic function of advertising in society. Lauterborn.

475 [175] CONCEPTS OF MARKETING (3). Designed for students anticipating careers in advertising, public relations or related areas, this course teaches the vocabulary and basic concepts of marketing as it will be practiced, emphasizing the role of mass communication. Lauterborn.

476 [118] ETHICAL ISSUES AND SPORTS COMMUNICATION (3). Permission of the instructor. Ethical dilemmas and decisions in the commercialization and coverage of sports, including the influence of television, pressure to change traditions and standards for monetary reasons and negative influences on athletes.

478 [178] MEDIA MARKETING (3). Prerequisites, JOMC 170 or equivalent. Principles and practices of retail advertising in all media, with emphasis on selling, writing and layout of retail advertising for the print media. Bowers.

480 [180] ADVANCED PHOTOJOURNALISM (3). Prerequisite, JOMC 180; pre- or corequisite, JOMC 153. Advanced course in photojournalism content gathering, history, ethics and storytelling. Students shoot advanced newspaper and magazine assignments and create short multimedia stories combining photography, audio and video. Beckman, Davison.

481 [181] DOCUMENTARY PHOTOJOURNALISM (3). Prerequisites, JOMC 480 and permission of the instructor. Students study the documentary tradition and produce stories within the social documentary genre of photojournalism. Students choose a relevant social issue and create a multimedia Web site featuring long-form documentary storytelling. Beckman, Davison.

482 [185] NEWSPAPER DESIGN (3). Prerequisite, JOMC 182; pre- or corequisite, JOMC 153; permission of the instructor. Detailed study of page layout and graphics techniques in newspapers.

483 [186] MAGAZINE DESIGN (3). Prerequisites, JOMC 482 and permission of the instructor. Detailed study of page layout and graphics techniques in magazines. Staff.

484 [187] INFORMATION GRAPHICS (3). Prerequisites, JOMC 182 and permission of the instructor. Study and application of graphic design and information-gathering techniques to creating charts, maps and diagrams. Cairo.

490 [191] SPECIAL TOPICS IN MASS COMMUNICATION (1–3). Small classes on various aspects of journalism and mass communication with subjects and instructors varying each semester. Descriptions for each section available on the school's Web site under Course Details. Staff.

491 [192] SPECIAL SKILLS IN MASS COMMUNICATION (1–3). Courses on various skills in journalism-mass communication with subjects and instructors varying each semester. This course satisfies a skills- or craft-course requirement. Descriptions for each section available on the school's Web site under Course Details. Staff.

560 [195] MEDICAL JOURNALISM (HBHE660) (HPAA 550) (3). Prerequisite, JOMC 153 or permission of the instuctor. Prepares students to work as medical journalists for a variety of media, including print, broadcast and the Internet. The course emphasizes writing skills and interpreting medical information for consumers. Linden.

561 [196] MEDICAL REPORTING FOR THE ELECTRONIC MEDIA (HBHE 561) (HPAA 551) (3). Prerequisite, JOMC 560 or permission of the instructor. Teaches students how to conceive, script, report and produce medical stories for electronic media, especially television. Students work in teams to produce projects for professional media outlets. Linden.

562 [197] SCIENCE DOCUMENTARY (HBHE 562) (HPAA 552) (3). Televison students learn skills needed to produce a science documentary for broadcast on television, including research and script writing. Linden.

564 ADVANCED MEDICAL REPORTING (3). Prerequisites, JOMC 153 and another reporting or writing course. Focuses on developing strategies to research and write about medical issues, specifically selecting topics, finding and evaluating sources and information gathering. Students produce a range of stories, from short consumer pieces to in-depth articles.

581 MULTIMEDIA DESIGN (3). Permission of the instructor. Theory and practice of multimedia design with an emphasis on usability, design theory and evaluative methodologies, including focus groups, survey research, eye-track testing and search engine optimization.

582 [188] INTERACTIVE MULTIMEDIA NARRATIVES (3). Permission of the school. Students will learn audio and video content gathering, editing and story telling techniques and how to publish these media onto a variety of multimedia platforms. Beckman.

583 [189] MULTIMEDIA PROGRAMMING AND PRODUCTION (3). Prerequisites, JOMC 187 and permission of the instructor. Advanced course in multimedia programming languages that includes designing and building dynamic projects. Beckman.

585 [491] 3D DESIGN STUDIO (3). Courses on various skills in journalism-mass communication with subjects and instructors varying each semester. This course satisfies a skills- or craft-course requirement.

602 [102] MASS COMMUNICATION EDUCATION IN THE SECONDARY SCHOOL (3). Prerequisite, graduate standing. Readings, discussion and projects fostering excellence in teaching journalism-mass communication in the high school, from philosophy and practice to professional skills. Hill.

603 [103] MASS COMMUNICATION LAW IN THE SECONDARY SCHOOL (3). Prerequisite, graduate standing. Application of First Amendment speech and press freedoms to secondary school media, including libel, privacy, access to information, journalistic privilege, prior restraint, advertising and broadcast regulation and ethical practices. Hill.

604 [104] MASS COMMUNICATION WRITING AND EDITING IN THE SECONDARY SCHOOL (3). Prerequisite, graduate standing. High school journalism teachers and advisers learn to teach the skills that journalists need to communicate. Emphasis on the writing and thinking skills necessary to convert information into clear messages. Hill.

605 [105] DESIGN AND PRODUCTION OF SECONDARY SCHOOL PUBLICATIONS (3). Prerequisite, graduate standing. High school journalism teachers and advisers learn to teach the skills that journalists need to produce publications. Designed for persons with no background in design. (Note: Degree-seeking students may not use both JOMC 182/185 and 605 to complete degree requirements.) Hill.

670 [193] SPECIAL TOPICS IN ADVERTISING (1–3). Courses on special topics in advertising with subjects and instructors varying each semester. Staff.

Courses for Graduates

701 [201] MASS COMMUNICATION RESEARCH METHODS (3). Covers a broad range of research methods used in industry and academic research. Course content includes: the process and organization of writing research; applying a variety of quantitative and qualitative research methods; evaluating research design; and ethical issues inherent in research. Required course for all graduate students. Curtin, Meyer.

702 [202] MASS COMMUNICATION PEDAGOGY (3). Investigation of college teaching and academic life, including course planning, syllabus preparation, interpersonal skills, presentational modes, evaluation and ways of balancing teaching with other expectations. Bowers, Walden.

703 [210] QUALITATIVE METHODS FOR MASS COMMUNICATION RESEARCH (3). Prerequisite, JOMC 701. Survey of naturalistic methods applied to mass communication research, including ethnography, in-depth interviews, life histories and text-based analysis. Curtin, Vargas.

704 [211] STATISTICS FOR MASS COMMUNICATION RESEARCH (3). Prerequisite, JOMC 701. Statistics with emphasis on application to studies in mass communication. Prior knowledge of statistics and familiarity with computer software are NOT assumed. Stevenson, Zhao.

705 [245] THEORIES OF MASS COMMUNICATION (3). Students prepare analytical papers on theories of mass communication based upon extensive review of behavioral science literature. Required of Ph.D. students and master's students in the mass communication sequence. Brown, Curtin, Fee, Gibson, Shaw.

730 [230] PUBLIC RELATIONS FOUNDATIONS (3). Introduction to the growing field of public relations practice: its history, legal and ethical issues, types and areas of practice and construction of public relations campaigns. Must be used as a basic competency class by master's students. This course cannot be counted toward a program of study for doctoral students. Dougall.

740 [264] MASS COMMUNICATION LAW (3). Intensive study of press freedom and the First Amendment, including libel, privacy, access to information, free press-fair trial, advertising and broadcast regulation, journalistic privilege, prior restraints. Required of all graduate students. Hoefges, Packer, Walden.

742 [242] READINGS IN MASS COMMUNICATION HISTORY (3). Directed readings in mass communication history. Required course for Ph.D. students. Fee.

743 [250] MEDIA MANAGEMENT (3). A study of planning policy functions related to media management concerns. Fee.

753 [253] REPORTING AND WRITING NEWS (4). Provides study and practice of the primary activities of a print journalist: gathering the news and writing about it for publication. Must be used as a basic competency class by master's students. This course cannot be counted toward a program of study for doctoral students. Fee.

754 [254] SPECIALIZED REPORTING (3). Prerequisite, JOMC 753 or permission of the instructor. Reporting of complicated topics, using in-depth backgrounding, investigative reporting techniques, story conferences and documents and other research data. Required of news-editorial master's students who plan to complete the articles option. Friedman, Yopp.

801 [301] SEMINAR IN MASS COMMUNICATION RESEARCH METHODS (3). Prerequisites, JOMC 701 or equivalent and permission of the instructor. Advanced work in quantitative data analysis and research preparation. Stevenson, Zhao.

825 SEMINAR IN INTERDISCIPLINARY HEALTH COMMUNICATION (3). Permission of instructor. Interdisciplinary overview of communication theory and research and critical analysis of applications of theory to interventions using communication for health.

826 INTERDISCIPLINARY HEALTH COMMUNICATION COLLOQUIUM (1). Commmunication Certificate Student. This course is structured for interactive student/faculty discussion on health communication research and practice. Seminar and online discussion format.

830 [330] SEMINAR IN PUBLIC RELATIONS (3). Readings, discussions and research in public relations. Boynton, Curtin, Straughan.

840 [364] SEMINAR IN MASS COMMUNICATION LAW (3). Prerequisite, JOMC 740 or permission of the instructor. Readings, discussion and projects in major issues of mass communication law, including libel, privacy, access, court-press relations, the First Amendment and regulation of telecommunications. Hoefges, Packer, Walden.

841 [340] SEMINAR IN MASS COMMUNICATION AND SOCIETY PERSPECTIVES (3). Readings, discussion and papers on the roles and responsibilities of mass communication in society. Johnston.

842 [342] SEMINAR IN MASS COMMUNICATION HISTORY (3). Readings, discussion and projects in mass communication history. Shaw.

846 [346] SEMINAR IN INTERNATIONAL COMMUNICATION (POLI 846) (3). Prerequisite, JOMC 446 or permission of the instructor. Reading and research in selected topics. Focus in recent years has included global news flow, communication and social change, communication in the collapse of communism, Western dominance in international communication, global culture and the influence of technology. Stevenson, Vargas

847 [347] SEMINAR IN COMMUNICATION FOR SOCIAL CHANGE (3). Examines how grassroots and participatory strategies are being combined with communication technologies to promote social change in Third World settings of developed and developing nations. Vargas.

870 [370] SEMINAR IN SOCIAL AND ECONOMIC PROBLEMS IN ADVERTISING (3). Readings, discussion and papers on advertising as a social and economic force in contemporary society. Bowers.

879 [379] SEMINAR IN ADVERTISING RESEARCH (3). Readings and discussion examining theories underlying advertising and the testing of those theories through research projects. Zhao.

890 [391] SEMINAR IN SPECIAL TOPICS IN MASS COMMUNICATION (3). Seminar on various aspects of mass communication, with content and instructors varying each semester. Staff.

900 [390] READING AND RESEARCH (3). Prerequisite, permission of the instructor. Advanced reading or research in a selected field. Staff.

992 [392] NONTRADITIONAL THESIS OPTION (3). Staff.

993 [393] MASTER'S THESIS (3). Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Staff.

Department of Linguistics

www.unc.edu/depts/ling
RANDALL HENDRICK, *Chair*

Advisory Committee

Professors C. Eble, R. Hendrick, W. Lycan, P. Roberge, S. Reznick, J. Thompson; Associate Professors J. Smith, M. Becker, Assistant Professors David Mora-Marín, E. Moreton, M. Terry

Professors

Randall Hendrick (11) Syntax, Morphology, Psychology of Language
Paul Roberge (17) Historical Linguistics, Germanic Linguistics, Pidgins and Creoles

Associate Professors

Misha Becker (12) Language Acquisition, Psycholinguistics, Cognitive Science
Jennifer L. Smith (7) Phonology, Phonetics, Japanese

Assistant Professors

David Mora-Marín (15) Historical Linguistics, Mayan Linguistics, Linguistic Anthropology
Elliott Moreton (8) Phonetics, Phonology
J. Michael Terry (9) Semantics

Associated Faculty

Connie Eble, English Linguistics
Lawrence Feinberg, Slavic Linguistics
Peter C. Gordon, Psychology of Language
Larry D. King, Spanish and Portuguese Linguistics
William Lycan, Philosophy of Language, Philosophy of Mind
Patrick O'Neill, Celtic Languages

The Department of Linguistics, comprised of specialists teaching core courses as well as faculty from nearly a dozen different departments, offers graduate work leading to the degrees of master of arts and doctor of philosophy in linguistics.

Degree candidates must demonstrate both a basic knowledge of the field of linguistics as a whole and the ability to do independent study in a chosen specialty. Basic knowledge of linguistics is acquired by taking certain required courses; knowledge of a specialty is gained through elective courses as well as by writing a thesis.

The elective courses are expected to form a coherent program in a subfield of linguistics (e.g., phonology, syntax, historical linguistics, sociolinguistics, language acquisition) or in the application of linguistics to a closely related discipline (e.g., anthropology, the study of a particular language or language family). To this end, each student, after consultation with the director of graduate studies, will by the beginning of the second semester of residence choose a permanent advisor, who will supervise the student's program of study.

Degree programs must satisfy the general requirements of The Graduate School. In addition, the student must fulfill the following curriculum requirements.

Master of Arts

Course Requirements. LING 400 (Introduction to General Linguistics), 520 (Linguistic Phonetics), 523 (Phonological Theory I), 530 (Syntactic Theory I), one course from among 525 (Historical Linguistics), 528 (Language Acquisition) and 537 (Semantic Theory I), plus four elective courses in linguistics or related areas, as approved by the student's advisor, plus three hours of thesis credit, for a total of 30 hours.

Note: Students are expected to complete their nonelective courses during their first year. This schedule qualifies students to take their comprehensive exam and to be considered for a linguistics teaching assistantship by their third semester. Deviations from it are therefore strongly discouraged.

Foreign Language Requirement. Reading knowledge of one foreign language (for students in historical linguistics, this must be German or French). This requirement may be met in one of three ways:

1. By passing the Graduate Student Foreign Language Test, given each November and April by The Graduate School. For precise dates, call or e-mail Ms. Leslie Van Meter, (919) 962-8145, lvanmeter@unc.edu. For a registration form, go directly to gradschool.unc.edu/gflpa.html.
2. Where available, by passing the reading courses for graduate students numbered 601 and 602 (these courses do not earn graduate credit). *Note: Students with some prior experience may find it feasible to meet the requirement by enrolling directly in and passing 602, bypassing 601.*
3. Where neither option 1 nor option 2 is available, students may arrange to have their competence certified by a qualified faculty member, usually through an informal examination.

Comprehensive Examination. During the semester following completion of the nonelective courses (which should be the fall term of the second year), students must take a three-part written exam covering: 1) phonetics/phonology, 2) syntax and 3) one area from among historical linguistics, language acquisition and semantics. The exam is based on the respective courses and a short reading list for each section, available from the department secretary. Previous exams are available for inspection in the department office. The exam is normally given in the second or third week of the fall semester as three separate take-home exams.

Thesis. The master's thesis (normally 50–100 pages in length) must be approved by a committee of the thesis director plus two other faculty members. Students form their thesis committee with the advice of their advisor, who may (but need not) be the thesis director. There is no preliminary oral exam for the M.A., but the department does require that students submit a prospectus of the thesis. The prospectus should state

clearly what problem is to be investigated, how the investigation is to be carried out (written research, field work, experiment, etc.) and a preliminary bibliography. The prospectus should first be discussed with the thesis director. Students should then submit a clean version to all three committee members and set up a meeting where the prospectus may be informally discussed and approved (perhaps with modifications). Students are also expected to consult their thesis director regularly during the actual writing of the thesis. Formal requirements regarding the format and submission of the M.A. thesis are found in the *Guide to the Preparation of Theses*, available from The Graduate School (this is essential reading).

Final Oral Examination. This exam, administered by the thesis committee, focuses on a defense of the thesis, but the faculty reserves the right to question students on other relevant topics. Students should avoid scheduling a thesis defense during the summer, since faculty members often are not available. If it is absolutely unavoidable, students should consult committee members well in advance.

Important Degree Deadlines. Each year The Graduate School sets deadlines for graduation in a given term (fall, spring, summer). There are two sets of dates to watch out for:

1. Students wishing to graduate must obtain an Application for Admission to Candidacy (AAC) from the department secretary, fill it out and have it signed, then take it to The Graduate School, where a Degree Card will also be filled out. These documents must be submitted in January for May graduation, June for August graduation and September for December graduation. There is no penalty for failure to complete requirements for a requested graduation date, but one cannot graduate without having submitted the AAC and the Degree Card. Therefore students should submit these forms in time for any semester in which they feel they may graduate.
2. Three copies of the finished thesis must be submitted to The Graduate School (by April for May graduation, by July for August graduation, by November for December graduation). The exact dates for 1 and 2 are given in the Graduate School Record and are also posted by the department secretary. Students are warned to keep track of these dates. The dates for a given semester may be found online at regweb.oit.unc.edu/calendars/index.php. Click on the relevant semester under "University Registrar's Calendars."

Ph.D. Requirements

Admission. Students are admitted to the Ph.D. program after completion of the M.A. either at UNC-Chapel Hill or at another institution. Those who complete the M.A. in the department are not automatically eligible for the Ph.D. program, nor may they continue to take courses in anticipation of working toward the Ph.D. Upon finishing the M.A., students may apply for admission to the Ph.D. program. Admission is based on evaluation of the student's overall performance and potential, including course work, comprehensive exam, thesis, and work as a teaching assistant. Outstanding students may request to skip the M.A. thesis and proceed directly to the Ph.D., but approval of such a request is not given lightly and should not be counted upon.

Students from other institutions are normally admitted directly to the Ph.D. program only if their M.A. degree is in linguistics. Such students are, upon completion of one semester of course work, required to take a diagnostic exam (similar in content to the M.A. comprehensive exam described above). This exam is intended to assure that Ph.D. students from elsewhere have the same basic knowledge contained in our courses required for the MA. If the faculty finds a student's performance on the exam unsatisfactory in some area, it may require various steps to correct the deficiency (such as assigning a specific course or reading).

Students whose M.A. degree is in a field other than linguistics are generally admitted to the M.A. program in linguistics (the core course requirements are the same for both the M.A. and Ph.D., so this does not delay a student's progress). These students have the same possibility for skipping the M.A. thesis and admission to the Ph.D. program as other M.A. students mentioned above.

Course Requirements. Fifty-one credit hours, of which three hours will be dissertation credit. Required are the courses stipulated for the M.A. plus any of the three courses—525 (Historical Linguistics), 528 (Language Acquisition) and 537 (Semantic Theory I) —not already taken. Students must also take either linguistic field work (LING 793) or an approved philology course (consult with the director of graduate studies), plus at least one course from among 524 (Phonological Theory II), 529 (Language Acquisition II), 533 (Syntactic Theory II) and 538 (Semantic Theory II). Students in historical linguistics should take one year of a classical language such as Latin, Greek or Sanskrit. Note: If circumstances do not permit offering a required course during the time needed by a given student, the department will waive the specific requirement.

Foreign Language Requirements. (a) All students must complete one year of a non-Indo-European language or one semester in the structure of a non-Indo-European language; (b) students in historical linguistics must demonstrate a reading knowledge of French and German.

Written Comprehensive Examination. The Ph.D. written comprehensive examination will consist of three essays: one each from the areas of phonetics/phonology and syntax, and one from either historical linguistics, language acquisition, or semantics. While each of these essays may present original research, it is expected that at least one of these papers will be a substantial research paper demonstrating the candidate's ability to conduct original research. Students may write the other two essays on questions chosen from an approved list available in the department. The topics of all other essays (including the research paper) will be approved by the faculty in the relevant area of specialization in consultation with the director of graduate studies. The essays may be submitted at any time between the passing of the diagnostic examination and the completion of course work. Details concerning the essays may be obtained from the director of graduate studies.

Oral Examination/Dissertation Proposal. This focuses on the dissertation proposal, but the examining committee may also question the student on other relevant topics. Toward the end of course work, students should seek out an appropriate faculty member as a dissertation director, with whom a dissertation proposal should be worked out (on the form and submission of the proposal, see remarks on the M.A. thesis prospectus). Sometimes two codirectors are appropriate. The dissertation proposal is presented at the oral examination to a committee of five faculty members who approve the topic. During the actual writing of the dissertation, students are expected to consult regularly with the director and at least two other members of the committee. Any radical change in the topic or plan requires reconvening of the entire dissertation committee and reapproval of the topic. The student should at an early date obtain from The Graduate School the Guide to Preparation of Theses and read it carefully.

Final Oral Examination. This exam centers on defense of the dissertation, but the committee reserves the right to question the student on other relevant topics. Students should never schedule a dissertation defense during the summer, since it is virtually impossible to arrange for the presence of all five committee members.

Important Degree Deadlines. Each year The Graduate School sets deadlines for graduation in a given term (fall, spring, summer). There are two sets of dates to watch out for:

1. Students wishing to graduate must obtain an Application for Admission to Candidacy (AAC) from the department secretary, fill it out and have it signed, then take it to The Graduate School, where a Degree Card will also be filled out. These documents must be submitted in January for May graduation, June for August graduation and September for December graduation. There is no penalty for failure to complete requirements for a requested graduation date, but one cannot graduate without having submitted the AAC and Degree Card. Therefore, students should submit these forms in time for any semester in which they feel they may graduate.
2. Three copies of the finished thesis must be submitted to The Graduate School (by April for May graduation, by August for August graduation, by December for December graduation). The exact dates for 1 and 2 are given in the Graduate School Record and are also posted by the department secretary. Students are warned to keep track of these. The dates for a given semester may be found online at regweb.oit.unc.edu/calendars/index.php. Click on the relevant semester under "University Registrar's Calendars."

Courses for Graduates and Advanced Undergraduates

400 [100] INTRODUCTION TO GENERAL LINGUISTICS (ANTH 400) (3). An introduction to the scientific study of language. The nature of language structure. How languages are alike and how they differ.

409 [109] COGNITIVE LINGUISTICS (SLAV 409) (3). Development of and present state of research in cognitive linguistics. Readings discuss various language phenomena and are drawn from linguistics, psychology, philosophy, artificial intelligence and literary analysis of metaphor.

415 [115] ADVANCED TOPICS IN LINGUISTICS (3). Directed readings on linguistic topics not covered in specific courses. Fall and spring. Staff.

445 [410] PHILOSOPHY OF LANGUAGE (PHIL 445) (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 345 recommended) or permission of the instructor. How does language represent? Does it mirror the structure of the world? Does it reflect the structure of the mind? Fall or spring. Lycan, Bar-On.

455 [104] SYMBOLIC LOGIC (PHIL 455) (3). Introduction for graduates and advanced undergraduates not taking the PHIL 155–356 sequence. Fall. Hofweber, Simmons.

484 [184] DISCOURSE AND DIALOGUE IN ETHNOGRAPHIC RESEARCH (ANTH 484, FOLK 484) (3). Study of cultural variation in styles of speaking applied to collection of ethnographic data. Talk as responsive social action and its role in the constitution of ethnic and gender identities. Holland.

506 [106] GREEK DIALECTS (GREK 506) (3). Permission of the instructor. Survey of the major dialects of Classical Greek and study of their derivation from Common Greek. Texts include both literary and epigraphical sources from the eighth century BCE to the Hellenistic Period.

520 [120] LINGUISTIC PHONETICS (ANTH 520) (3). Introduction to the general principles of linguistic phonetics; anatomy of vocal tract, physiology of speech production, universal phonetic theory. Practice in the recognition and transcription of speech sounds. Fall. Moreton, Smith.

523 PHONOLOGICAL THEORY I (ANTH 523) (3). Prerequisite, LING 520 or equivalent. Introduction to the principles of modern generative phonology. Methods and theory of phonological analysis. Not normally open to those who have taken LING 200, unless permission of the instructor is given. Spring. Moreton, Smith.

524 PHONOLOGICAL THEORY II (3). Prerequisite, LING 523. Intermediate phonological theory and analysis. Fall. Moreton, Smith.

525 [101] INTRODUCTION TO HISTORICAL AND COMPARATIVE LINGUISTICS (3). Theories and methods of historical and comparative linguistics, with emphasis upon the Indo-European family. Spring. Roberge, Mora-Marín.

527 [127] MORPHOLOGY (3). Prerequisite, LING 101, 400 or permission of the instructor. Cross-linguistic investigation of internal word structure: inflection and derivation, word formation rules versus affixation, autosegmental morphology, morpholexical and morphophonemic rules, and the interaction of morphology with phonology and syntax.

528 [210] LANGUAGE ACQUISITION I (3). Child language from a theoretical perspective. Topics include segmentation problems, acquisition of phonology, morphology and syntax, lexical acquisition, and language development in blind and deaf children and in bilinguals. Spring. Becker.

529 LINGUISTIC ACQUISITION II (3). Prerequisite, LING 203 or 528. This course focuses on the development of syntax in first language acquisition in children. Topics will include parameter setting, null subjects, root infinitives, aspect, A-movement, binding theory and control.

530 SYNTACTIC THEORY I (3). Prerequisite, LING 400 or equivalent, or permission of the instructor. Methods and theory of grammatical analysis within the transformational generative framework. Special emphasis on analyzing syntactic and semantic structures of English. Fall. Hendrick.

533 SYNTACTIC THEORY II (3). Prerequisite, LING 530 or equivalent. Methods and theory of grammatical analysis, with special reference to transformational grammar. Spring. Hendrick.

537 SEMANTIC THEORY I (3). Prerequisite, LING 101, 400 or permission of the instructor. Semantics as a part of linguistic theory: co- and disjoint reference among nominals, "crossover" phenomena, quantifier scope, lexical semantics, Montague grammar and compositional semantics, and explanatory universals in semantic theory. Terry.

538 SEMANTIC THEORY II (3). Prerequisite, LING 537 or permission of the instructor. A continuation of LING 537 (Semantic Theory I), this course prepares the student to read the formal semantic literature and to do original research in the field.

539 [139] LANGUAGE OF TIME (3). Prerequisite, LING 101, 400 or permission of the instructor. The representation of time and temporal relations in natural languages. Cross-linguistic study of tense and aspect distinctions, modality, temporal adverbials, temporal anaphora and sequences of tenses. Terry.

540 [140] MATHEMATICAL LINGUISTICS (3). Introduction to topics in logic, set theory and modern algebra with emphasis on linguistic application. Automata theory and the formal theory of grammar with special reference to transformational grammars. No previous mathematics assumed. Staff.

541 [170] SOCIOLINGUISTICS (ANTH 541) (3). Prerequisite, LING 101, 400 or permission of the instructor. Introduction to the study of language in relation to society; variation as it correlates with socioeconomic status, region, gender; the social motivation of change; language and equality; language maintenance, planning, shift. Spring. Roberge, Mora-Marín.

542 [172] PIDGINS AND CREOLES (GERM 542, ANTH 542) (3). Prerequisite, LING 101, 101H or equivalent, or permission of the instructor. Examination of the linguistic features of pidgin and creole languages, the sociohistorical context of their development, and their import for current theoretical issues (acquisition, universals, language change). Roberge.

543 [175] LANGUAGE IN POLITICS (3). Examines language as a political issue in the 19th and 20th centuries. Emphasis placed on American and British politics but attention to one other national context as well. Roberge, Hendrick.

545 [145] LANGUAGE AND MIND: LINGUISTICS AND THE BRAIN (3). Prerequisite, LING 101, 400; PHIL 145; ENGL 313; or permission of the instructor. The course treats the relationship among linguistics, artificial

intelligence, neurobiology, cognitive psychology and the philosophies of mind, language and science. Becker, Hendrick.

547 [147] LANGUAGE DEFICITS AND COGNITION (3). Prerequisite, LING 101 or permission of the instructor. Survey of the linguistic properties associated with aphasia, autism, Williams syndrome, dyslexia and schizophrenia. Emphasis on the implications of these conditions for theories of mind. Terry.

550 [150] INTRODUCTION TO INDO-EUROPEAN: PHONOLOGY (3). A survey of the phonological systems of the major Indo-European languages and their development from Proto-Indo-European.

551 [151] INTRODUCTION TO INDO-EUROPEAN: MORPHOLOGY (3). Prerequisite, LING 550 or permission of the instructor. Introduction to the major morphological categories in the Indo-European languages and their development from the proto-language.

561 [161] NATIVE LANGUAGES OF THE AMERICAS (3). Prerequisite, LING 101, 400 or permission of the instructor. This course explores the phonological and morphological structure of selected Amerindian languages indigenous to the Americas. Emphasis is on the linguistic analysis of original as well as published primary data.

563 STURCTURE OF JAPANESE (JAPN 563) (3). Prerequisites, JAPN 102 and LING 101, or permission of the instructor. Introductory linguistic description of modern Japanese. For students of linguistics with no knowledge of Japanese and students of Japanese with no knowledge of linguistics.

564 [164] HISTORY OF THE FRENCH LANGUAGE (FREN 564) (3). Prerequisite, FREN 300 or permission of the instructor. The phonology, morphology and syntax of French are traced from the Latin foundation to the present. Lectures, readings, discussions and textual analysis.

565 [165] FRENCH PHONETICS AND PHONOLOGY (FREN 565) (3). Prerequisite, FREN 300 or equivalent, or permission of the instructor. The study of sounds as system in modern standard French. Lecture, discussion, laboratory practice in practical phonetics according to individual needs.

566 [166] STRUCTURE OF MODERN FRENCH (FREN 566) (3). Prerequisite, FREN 300 or equivalent, or permission of the instructor. Introduction to phonology, morphology and syntax of modern standard French. Application of modern linguistic theory to the teaching of French.

583 [183] HISTORY AND PHILOSOPHY OF LINGUISTICS (3). Prerequisite, LING 101 or permission of the instructor. Linguistic theories from classical times to the present with special emphasis on the origins of contemporary theories.

613 [136] GRAMMAR OF CURRENT ENGLISH (ENGL 613) (3). A study of current English structure and usage using a traditional approach modified by appropriate contributions from structural and generative grammar, with some attention to the application of linguistics to literary analysis.

Courses for Graduates

704 [204] COMPARATIVE GRAMMAR OF GREEK AND LATIN (3). Designed not only for the student of classics but also as a basic course for students of comparative Indo-European grammar. (Alternate years.)

715 [215] ADVANCED METHODS IN PHONOLOGY (3). Prerequisite, LING 524. Methods of theoretical argumentation in generative phonology with emphasis on recent proposals in the published literature. Fall. Moreton, Smith.

716 [216] ADVANCED METHODS IN SYNTAX (3). Prerequisite, LING 533 or permission of the instructor. Examination of recent developments in the theory and methods of syntactic analysis. Fall. Hendrick.

723 [223] SEMINAR IN ANTHROPOLOGICAL LINGUISTICS (ANTH 723) (3).

730 [230] COMPARATIVE GRAMMAR OF ANCIENT LANGUAGES (3). Introductory and advanced work in the earlier stages of extant languages, such as Avestan and Sanskrit, and in extinct languages. Spring. Melchert.

790 [250] DIALECTOLOGY (ANTH 790) (3). Principles and methods of areal linguistics and social dialectology. (On demand.)

793 [293] LINGUISTIC FIELD WORK (ANTH 793) (3). Analysis and description of a language unknown to the class from data solicited from a native informant. (Alternate years.)

794 [294] LINGUISTIC FIELD WORK II (ANTH 794) (3).

814 [238] HISTORY OF THE ENGLISH LANGUAGE (ENGL 814) (3). Prerequisite, ENGL 719 or permission of the instructor.

860 [360] SEMINAR (3). Topics vary to include specialized areas of linguistics study.

861 [361] SEMINAR (3). Seminar in phonological theory.

862 [362] SEMINAR (3). Seminar in grammatical theory.

893 [283] CURRENT PROBLEMS IN LINGUISTICS (3). This course explores relations of linguistics with neighboring fields and theoretical problems of current relevance within linguistics itself; some attention given to pedagogical methodology. Fall and spring. Staff.

897 [297] SPECIAL READINGS (3). Readings in linguistic topics that are not covered in the existing courses. Fall and spring. Staff.

992 [393] MASTER'S THESIS (3 or more). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Sanskrit

411 [111] ELEMENTARY SANSKRIT (3). Grammar and readings from the epic and didactic literature. Fall. (On demand.) Melchert.

412 [112] ELEMENTARY SANSKRIT (3). Continuation of SANS 411. Spring. (On demand.) Melchert.

413 [201] ADVANCED SANSKRIT (3). Extensive reading from the Dharmacastra, the Sutras, Brahamanas and the Vedas. (On demand.) Staff.

414 [202] ADVANCED SANSKRIT (3). Continuation of SANS 413. (On demand.) Staff.

For Irish and Welsh, see under English; for Hebrew, see under Religious Studies; for Arabic, Chinese and Japanese, see under Asian Studies in the *Undergraduate Bulletin*.

Department of Marine Sciences

www.marine.unc.edu
BRENT A. MCKEE, *Chair*
Carol Arnosti, *Associate Chair*
John M. Bane, *Director of Graduate Studies*
Marc J. Alperin, *Director of Graduate Admissions and Undergraduate Studies*

Professors

Carol Arnosti (46) Marine Organic Geochemistry
John M. Bane (27) Physical Oceanography and Meteorology, Gulf Stream and Upwelling Dynamics
Larry K. Benninger (41) Sedimentary Geochemistry
Joseph G. Carter (34) Marine Paleoecology, Molluscan Systematics
Niels Lindquist (53) Chemical Ecology, Natural Products
Richard A. Luettich (48) Coastal Water Dynamics and Quality
Christopher S. Martens (10) Marine Geochemistry
Brent A. McKee Geochemistry/Geology of River-Ocean Environments, Sedimentary Geochemisty/Radiochemistry
Hans W. Paerl (39) Microbial Ecology
Charles H. Peterson (31) Ecology, Population Interactions
Frederic K. Pfaender (13) Microbiology

Andreas Teske (09) Microbial Systematics and Evolution; Microbial Ecology; Microbiology of Hydrothermal Vents and the Marine Subsurface

Associate Professors

Marc J. Alperin (51) Chemical Oceanography, Biogeochemistry
John Bruno (03) Coastal Ecology, Population Ecology
Rachel Noble (18) Dynamics of Marine Microbial Food Webs
Anthonio Rodriguez, Sedimentology, Marine and Coastal Geology
Alberto Scotti (07) Computational and Theoretical Fluid Dynamics, Statistical Mechanics, Mathematical Physics
Harvey E. Seim (06) Observational Physical Oceanography, Coastal and Estuarine Dynamics

Assistant Professors

Mike Piehler, Coastal Ecosystems and Estuarine Ecology
Justin Ries, Carbonate Geology/Biogeochemisty, Experimental Paleobiology
Brian L. White, Fluid Dynamics of Coastal Marine Systems, Hydrodynamics of Aquatic Vegetation, Gravity Currents, Shear Flows and Internal Waves
Research Assistant Professors
Dan Albert, Carbon Cycling in Sedimentary Environments, Organic Matter Decomposition in Anaerobic Systems
Barbara MacGregor, Microbial Ecology

Joint Research Assistant Professor

Thomas J. Shay (50) Gulf Stream Dynamics, Air-Sea Interaction, Turbulence

Faculty Emeriti

A. Conrad Neumann
Jan J. Kohlmeyer

Adjunct Faculty

Frederick M. Bingham (UNC-Wilmington, Physics), Circulation and Water Mass Transportation
Mark E. Hay (Georgia Tech), Marine Ecology
William M. Kier (Biology), Functional Morphology of Invertebrates, Biomechanics
Kenneth J. Lohmann (Biology), Sea Turtle Navigation, Neuroethology of Sea Slug Orientation, Lobster Homing and Navigation
Joseph Pawlik (UNC-Wilmington, Biology), Marine Ecology
Martin H. Posey (UNC-Wilmington, Biology), Population Dynamics of Marine Organisms
Stanley Riggs (East Carolina University, Geology), Marine and Coastal Geology, Sedimentology, Stratigraphy, Economic Geology
John J. W. Rogers (Geology), Geochemistry, Crustal Evolution
Stephen A. Skrabal (UNC-Wilmington, Chemistry), Trace Metal Geochemistry in Natural Waters
Mark D. Sobsey (Environmental Sciences), Environmental Health Microbiology
Robert H. Stavn (UNC-Greensboro, Biology,) Ocean Optical Properties
Joan D. Willey (UNC-Wilmington, Chemistry), Chemical Composition of Rainwater, Silica Geochemistry

The Department of Marine Sciences provides teaching and research in estuarine, coastal and oceanographic sciences, leading to M.S. and Ph.D. degrees in marine sciences. The two elements of the program are the Department of Marine Sciences (MASC) located in Chapman Hall on the Chapel Hill campus and the Institute of Marine Sciences (IMS) located on the waterfront in Morehead City, North Carolina. The Department of Marine Sciences is the degree granting unit; all marine sciences graduate students are enrolled in the department. Most IMS faculty have joint faculty appointments in the department, and this enables their participation in graduate student academic activities. Research programs in physical oceanography, marine biology and ecology, marine geochemistry, geological oceanography and coastal meteorology are conducted in North Carolina and throughout the world by faculty from the department and the IMS.

Courses and facilities at other coastal laboratories are also available to UNC-Chapel Hill marine sciences students through cooperative agreements. Courses at North Carolina State University and at Duke University may be taken for credit through an inter-institutional program. Oceanographic experience is available through the Duke/UNC Oceanographic Consortium on the 135-foot research vessel Cape Hatteras, as well as on other ships operated by other oceanographic institutions through the University National Oceanographic Laboratory System.

Each graduate student in the Department of Marine Sciences must gain a broad background in the marine sciences as well as an in-depth understanding of his or her own sub-discipline (e.g., chemical oceanography, etc.). This is accomplished by taking the four core courses, Geological Oceanography, Biological Oceanography, Chemical Oceanography and Physical Oceanography (MASC 503, 504, 505 and 506, respectively), and advanced courses determined by each student's advisory committee, as well as by participating in research that ultimately results in an M.S. thesis or a Ph.D. dissertation. By the end of the 24-month period that begins when the student first enrolls in the department, the student is expected to have completed the four core courses, How to Give a Seminar (MASC 705), Interdisciplinary Seminar (MASC 706), and to have taken a written comprehensive exam (M.S. students) in his or her subdiscipline. Further information on degree requirements may be found at www.marine.unc.edu.

Requirements for Admission

For admission to the Department of Marine Sciences, an undergraduate degree is required in a basic science such as physics, mathematics, chemistry, biology, bacteriology, botany, zoology, geology or in computer science or engineering. Students are advised to develop a broad undergraduate science major with as many as possible of the following courses: mathematics through calculus, computer science, physics, general and organic chemistry, physical chemistry, invertebrate zoology or paleontology, botany, zoology, ecology, physiology, geology and statistics.

Degree Requirements

Doctor of Philosophy. The academic program for a Ph.D. student will be supervised by a faculty advisory committee of at least five drawn from the graduate faculty. Course requirements normally include the four core courses, additional advanced courses determined by the student's advisory committee, one hour of MASC 705 How to Give a Seminar and one hour of MASC 706 *Interdisciplinary Seminar*. A waiver for one or more of the core courses can be arranged with approval of the student's advisory committee and the Department of Marine Sciences Performance Committee. Additional requirements include the presentation of a satisfactory research seminar, passing a comprehensive examination containing both written and oral parts, scientific research resulting in a written dissertation, which is defended by the student, a period of study or research at a marine station or participation on an oceanographic cruise and teaching experience sufficient to develop and demonstrate competence. Requirements for comprehensive examinations, admission to candidacy, residence credit, the dissertation and final oral examination are provided in the *Marine Sciences Graduate Student Handbook* and in the regulations found in *The Graduate School Handbook* (both available at marine.unc.edu).

Master of Science. The M.S. degree program is similar to the Ph.D. program except for the following: the advisory committee will be composed of three faculty members, the comprehensive examination

is a written exam only and scientific research will result in a written thesis, to be defended by the student. Requirements for comprehensive examinations, admission to candidacy, residence credit, the dissertation and final oral examination are provided in the *Marine Sciences Graduate Student Handbook* and in the regulations found in *The Graduate School Handbook* (both available at marine.unc.edu).

Marine Sciences Core Courses

503 GEOLOGICAL OCEANOGRAPHY (GEOL 503) (4). Prerequisite, GEOL 101 or 111, or permission of the instructor. Ocean basin origin, continental margin development, coastal geology, carbonate platforms, and pelagic sediments are subjects covered; paleo-oceanographic reconstructions are emphasized. Three lecture and two recitation hours a week. Spring. Neumann.

504 BIOLOGICAL OCEANOGRAPHY (BIOL 657, ENVR 520) (4). Prerequisite, BIOL 201 or 475, or permission of the instructor. Physical, chemical and biological factors characterizing estuarine and marine environments. Emphasizes factors controlling animal and plant populations. Includes experimental approaches and methods of analysis, sampling and identification. Three lecture and two recitation hours a week. Spring. Staff.

505 CHEMICAL OCEANOGRAPHY (ENVR 505, GEOL 505) (4). Prerequisite, one semester of physical chemistry or CHEM 480, or permission of the instructor. Overview of chemical processes in the ocean. Topics include physical chemistry of seawater, major element cycles, hydrothermal vents, geochemical tracers, air-sea gas exchange, particle transport, sedimentary processes and marine organic geochemistry. Three lecture and two recitation hours a week. Fall. Alperin, Arnosti, Martens.

506 PHYSICAL OCEANOGRAPHY (GEOL 506) (4). Prerequisites, MATH 231, 232; PHYS 104, 105; or permission of the instructor. Descriptive regional oceanography, equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation, modern observations, waves, tides. Three lecture and two recitation hours a week. Fall. Bane, Seim.

Other Marine Sciences Courses

101 [12] THE MARINE ENVIRONMENT (GEOL 103) (3). Introduction to natural science emphasizing physical, chemical, biological and geological phenomena in oceanic and coastal environments. Human use of, and impact on, marine resources. (Science majors see MASC 401.) Fall and spring. Staff.

223 [123] (3). GEOLOGY OF BEACHES AND COASTS (GEOL 223) (3). Introduction to coastal processes, including waves, tidal currents, tectonics, climate and human activity, and their influence on barrier islands, beaches, dunes, marshes and estuaries. Involves a field trip to the Outer Banks of North Carolina.

401 [101] OCEANOGRAPHY (BIOL 350, ENVR 417, GEOL 403) (3). Prerequisites, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record and the history of oceanography. Term paper. Intended for students with college science background; other students should see MASC 101. Three lecture hours a week. Fall and spring. Staff.

410 [111] EARTH PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 410, GEOL 410) (4). Prerequisites, CHEM 102, GEOL 111 or 213, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of geological and related Earth systems sciences are applied to the analysis of environmental phenomena. The link between the lithosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one laboratory hour a week.

411 [112] OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 411, GEOL 411) (4). Prerequisites, BIOL 101, CHEM 102, ENST 222, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of analysis of the ocean, coast and estuarine environments and the processes that control these environments are applied to the analysis of environmental phenomena. The link between the hydrosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one laboratory hour a week.

415 [116] ENVIRONMENTAL SYSTEMS MODELING (ENST 415, ENVR 461, GEOL 415) (3). Prerequisites, MATH 383, PHYS 105 or 117 (may be taken concurrently), or permission of the instructor. Methods for developing explanatory and predictive models of environmental processes are explored. Includes discussion of the relevant scientific modes of analysis, mathematical methods, computational issues and visualization techniques. Two lecture hours and one computer laboratory hour a week.

430 [125] COASTAL SEDIMENTARY ENVIRONMENTS (GEOL 430) (3). Prerequisite, GEOL 402. Introduction to modern shallow-water clastic environments and their sediments, emphasizing barrier islands, deltas, estuaries, wetlands and tidal flats. Includes local field trips and discussion/application of data-collecting techniques. Fall. Staff.

431 [133] MICROPALEONTOLOGY (GEOL 431) (4). Prerequisite, GEOL 478, MASC 440, or permission of the instructor. An in-depth study of the biostratigraphy, paleoecology, and taxonomy of various microfossil groups (i.e., foraminifera, ostracodes, conodonts, coccoliths, radiolaria, diatoms, acritarchs, dinoflagellates, etc.) dependent upon individual student objectives. Three lecture and three laboratory hours a week.

436 [136] COASTAL PROCESSES (4). An interdisciplinary description and analysis of environmental processes that form and maintain coastal habitats. Coastal aspects of geology, fluid dynamics, chemistry and biology are considered. Two lectures per week and two coastal field trips.

440 MARINE ECOLOGY (BIOL 462) (3). Prerequisite, BIOL 201 or 475. Survey of the ecological processes that structure marine communities in a range of coastal habitats. Course emphasizes experimental approaches to addressing basic and applied problems in marine systems. Fall. Bruno.

442 [148] MARINE BIOLOGY (BIOL 457) (3). Prerequisite, BIOL 201 or 475; MASC 101; or permission of the instructor. A survey of plants and animals that live in the sea: characteristics of marine habitats, organisms and the ecosystems will be emphasized. Marine environment, the organisms involved and the ecological systems that sustain them. Fall. Staff.

445 [150] MARINE INVERTEBRATE BIOLOGY (BIOL 475) (4). Prerequisites, BIOL 101 and 101L and one additional course in biology. An introduction to the major animal phyla emphasizing form, function, behavior, ecology, evolution and classification of marine invertebrates. Three lecture and three laboratory hours per week. Spring. Lohmann, Podolsky.

448 [135] COASTAL AND ESTUARINE ECOLOGY (ENST 472) (4). Prerequisites, CHEM 102 and MATH 231. A field intensive study of the ecology of marine organisms and their interactions with their environment, including commercially important organisms. Laboratory/recitation/field work is included and contributes two credit hours to the course.

449 [137] ECOLOGY OF WETLANDS (ENVR 449) (4). Prerequisites, one year of biology, one year of chemistry, one semester of ecology and permission of the instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on systems of the southeastern U.S. Fall. Staff.

450 [119] INTRODUCTION TO BIOGEOCHEMICAL PROCESSES (ENST 450, ENVR 415, GEOL 450) (4). Prerequisites CHEM 251 or 261, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of chemistry, biology and geology are applied to analysis of the fate and transport of materials in environmental systems, with an emphasis on those materials that form the most significant cycles. The course examines these processes in systems that contain the hydrosphere, lithosphere, atmosphere and biosphere. Three lecture hours and one lab hour a week. Fall. (Alternate years.) Arnosti, Martens.

470 [154] ESTUARINE AND COASTAL MARINE SCIENCE (4). Prerequisites, MATH 231 and either CHEM 101 or PHYS 104. Introduction to the

estuarine and coastal environment: geomorphology, physical circulation, nutrient loading, primary and secondary production, carbon and nitrogen cycling, benthic processes and sedimentation. Consideration given to human impact on coastal systems with emphasis on North Carolina estuaries and sounds. Includes a mandatory weekend field trip. Three lecture and two recitation hours a week. Fall. Alperin.

471 [134] HUMAN IMPACTS ON ESTUARINE ECOSYSTEMS (ENST 471) (4). Prerequisites, CHEM 102 and MATH 231. A cohesive examination of the human impacts on biological processes in estuarine ecosystems. Laboratory/recitation/field work is included and contributes two credit hours to the course.

472 BARRIER ISLAND ECOLOGY AND GEOLOGY (6). Prerequisites, courses in general ecology or geology, or permission of the instructor. An integration of barrier island plant and animal ecology within the context of physical processes and geomorphological change. Emphasis on management and impact of human interference with natural processes. Summer. Peterson and Rodriguez.

480 [152] MODELING OF MARINE AND EARTH SYSTEMS (ENVR 480, GEOL 480) (1–3). Prerequisite, MATH 232 or permission of the instructor. Mathematical modeling of dynamic systems, linear and nonlinear. The fundamental budget equation. Case studies in modeling transport, biogeochemical processes, population dynamics. Analytical and numerical techniques; chaos theory; fractal geometry. Spring. Rial, Scotti, Werner.

483 [129] GEOLOGIC AND OCEANOGRAPHIC APPLICATIONS OF GEOGRAPHICAL INFORMATION SYSTEMS (GEOL 483) (4). Prerequisites, four GEOL courses or permission of the instructor. Focus is on applying GIS concepts and techniques to mining and petroleum geology, resource assessment, hydrogeology, coastal and marine geology, physical oceanography, engineering geology and a geologic perspective on land use. Three lecture and two laboratory hours a week. Spring. Staff.

490 SPECIAL TOPICS IN MARINE SCIENCES FOR UNDERGRADUATES AND GRADUATES (2–4). Prerequisites, science background and permission of the instructor. Directed readings, laboratory, and/or field study of marine science topics not covered in scheduled courses.

499 EXPERIMENTAL COURSE FOR GRADUATES (2–4).

503 [103] GEOLOGICAL OCEANOGRAPHY (GEOL 503) (4). Prerequisite, GEOL 101 or 111, or permission of the instructor. Ocean basin origin, continental margin development, coastal geology, carbonate platforms and pelagic sediments are subjects covered; paleo-oceanographic reconstructions are emphasized. Three lecture and two recitation hours a week.

504 [104] BIOLOGICAL OCEANOGRAPHY (BIOL 657, ENVR 520) (4). Prerequisite, BIOL 201 or 475, or permission of the instructor. Physical, chemical and biological factors characterizing estuarine and marine environments. Emphasizes factors controlling animal and plant populations. Includes experimental approaches and methods of analysis, sampling and identification. Three lecture and two recitation hours a week.

505 [105] CHEMICAL OCEANOGRAPHY (ENVR 505, GEOL 505) (4). Prerequisite, one semester of physical chemistry or CHEM 480, or permission of the instructor. Overview of chemical processes in the ocean. Topics include physical chemistry of seawater, major element cycles, hydrothermal vents, geochemical tracers, air-sea gas exchange, particle transport, sedimentary processes, and marine organic geochemistry. Three lecture and two recitation hours a week.

506 [106] PHYSICAL OCEANOGRAPHY (GEOL 506) (4). Prerequisites, MATH 231, 232; PHYS 104, 105; or permission of the instructor. Descriptive regional oceanography, equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation, modern observations, waves, tides. Three lecture and two recitation hours a week.

550 [140] BIOGEOCHEMICAL CYCLING (GEOL 550) (3). Prerequisites, ENVR 421; GEOL 510, 512, 655; MASC 440, 505; or permission of the instructor. Biogeochemical cycling explores interfaces of marine, aquatic, atmospheric and geological sciences emphasizing processes controlling chemical distributions in sediments, fresh and salt water, the atmosphere and fluxes among these reservoirs. Fall and spring. Martens, Arnosti, Teske.

551 [143] BIOGEOCHEMICAL TECHNIQUES (2). Pre- or corequisite, MASC 505. Introduction to fundamental techniques used in biogeochemical research including sampling, instrumental and wet chemical analytical measurements, use of stable isotopes and rate measurements using radioactive tracers. Spring. Albert.

552 [144] ORGANIC GEOCHEMISTRY (ENVR 552, GEOL 552) (3). Prerequisite, CHEM 261 or MASC 505, or permission of the instructor. Sources, transformations and fate of natural organic matter in marine environments. Emphasis on interplay of chemical, biological and physical processes that affect organic matter composition, distribution and turnover. Fall. (Alternate years.) Arnosti.

553 [145] GEOCHEMISTRY (GEOL 512) (3). Prerequisites, CHEM 102, GEOL 101 or 111, or permission of the instructor. Introduction to the application of chemical principles to geological problems, with emphasis on isotope methods. Spring. (Alternate years.) Benninger.

560 [151] FLUID DYNAMICS (ENVR 452, GEOL 560, PHYS 660) (3). Prerequisite, PHYS 301 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Three lecture hours a week. Fall. Scotti.

561 [153] TIME SERIES AND SPATIAL DATA ANALYSIS (3). Prerequisites, differential and integral calculus. Three components: statistics and probability, time series analysis and spatial data analysis. Harmonic analysis, nonparametric spectral estimation, filtering, objective analysis, empirical orthogonal functions. Spring. (Alternate years.) Seim.

562 TURBULENT BOUNDARY LAYERS (3). Prerequisite, MASC 506 or 560 or permission of the instructor. Turbulence and transport in near-bottom boundary regions. Turbulence and mixing theory in boundary layers. Field deployment and recovery of turbulence measuring instruments. Data analysis from turbulence measurements. (Alternate summers.) Scotti.

563 DESCRIPTIVE PHYSICAL OCEANOGRAPHY (GEOL 563) (3). Prerequisite, MASC 506 or permission of the instructor. Observed structure of the large-scale and mesoscale ocean circulation and its variability, based on modern observations. In-situ and remote sensing techniques, hydrographic structure, circulation patterns, ocean-atmosphere interactions. Spring. (Alternate years.) Bane, Seim.

705 HOW TO GIVE A SEMINAR (1).

706 [206] SEMINAR IN OCEANOGRAPHY (1). Discussion of theories and contemporary research in ocean systems. Topics stress interactions between physical, chemical, geological and biological processes in the sea. For graduate students in marine sciences. Students who enroll must present an interdisciplinary seminar. Fall and spring. Staff.

741 [248] SEMINAR IN MARINE BIOLOGY (2). Discussion of selected literature in the field of marine biology, ecology and evolution. Fall, spring or summer. Bruno.

742 [147] MOLECULAR POPULATION BIOLOGY (BIOL 758) (4). Prerequisites, BIOL 471 and permission of the instructor. Hands-on training, experience and discussion of the application of molecular genetic tools to questions of ecology, evolution, systematics and conservation.

750 [250] MODELING DIAGENETIC PROCESSES (3). Prerequisite, MASC 480 or permission of the instructor. An introduction to the theory and application of modeling biogeochemical processes in sediments. Diagenetic theory, numerical techniques and examples of recently developed sediment models. Three lecture hours a week. Spring. (Alternate years.) Alperin.

761 [251] GEOPHYSICAL FLUID DYNAMICS (3). Prerequisite, MASC 560, MATH 528 or permission of the instructor. Momentum equations in a rotating reference frame, vorticity, potential vorticity, circulation, the shallow

water model, Rossby and Kelvin waves, the Ekman layer. Three lecture hours a week. Spring. (Alternate years.) Bane, Seim, Scotti.

762 [252] OCEAN CIRCULATION THEORY (3). Prerequisite, MASC 506, MASC 560, MATH 529, or permission of the instructor. Theories, models of large-scale dynamics of ocean circulation. Potential vorticity, quasi-geostrophy, instabilities. Fall. (Alternate years.) Bane, Seim, Scotti, Werner.

763 [253] COASTAL CIRCULATION (3). Prerequisite, MASC 506, MASC 560, MATH 529, or permission of the instructor. Dynamics of the coastal ocean. Shallow water equations, boundary layer and long wave theory, wind driven circulation, fronts, estuaries. Fall. (Alternate years.) Werner, Luettich, Seim.

764 [254] OCEAN CIRCULATION MODELING (3). Prerequisite, MASC 506, MATH 529, or permission of the instructor. Computational methods used in modeling oceanic circulation. Numerical solution of equations governing mass, momentum and energy equations. Spring. (Alternate years.) Werner.

765 [255] SMALL-SCALE PHYSICS OF THE OCEAN (3). Prerequisites, MASC 506, MASC 560. Physics of sub-mesoscale processes in the ocean. Non-equilibrium thermodynamics. Air-sea interaction. Mixing in the ocean boundary layer, convection, double diffusion. Near-inertial and high frequency internal waves. Three lecture hours a week. Spring. (Alternate years.) Seim, Shay.

781 [221] NUMERICAL ODE/PDE I (MATH 761, ENVR 761) (3). Single, multistep methods for ODEs: stability regions, the root condition; stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations. Fall. Staff.

782 [222] NUMERICAL ODE/PDE II (MATH 762, ENVR 762) (3). Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Spring. Staff.

783 [228] MATHEMATICAL MODELING I (MATH 768, ENVR 763) (3). Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; deviation of classical models of fluid mechanics (lubrication, slender filament, thin filing, Stokes flow); deviation of weakly nonlinear envelope equations. Fall. Staff.

784 [229] MATHEMATICAL MODELING II (MATH 769, ENVR 764) (3). Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs); geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Spring. Staff.

940 [300] RESEARCH IN MARINE SCIENCES (2 or more).

992 [393] MASTER'S THESIS (3 or more).

994 [394] DOCTORAL DISSERTATION (3 or more).

Courses in other departments that are considered appropriate for a graduate major in marine sciences:

BIOL 201 ECOLOGY AND POPULATION BIOLOGY. Staff.

BIOL 475 INVERTEBRATE ZOOLOGY. Lohman.

BIOL 451 COMPARATIVE PHYSIOLOGY. Kier.

BIOL 451L COMPARATIVE PHYSIOLOGY LABORATORY. Kier.

BIOL 453 ANIMAL SOCIETIES AND COMMUNICATION. Wiley.

BIOL 455 NEUROETHOLOGY. Lohmann.

BIOL 478 INVERTEBRATE PALEONTOLOGY. Carter.

BIOL 551 COMPARATIVE BIOMECHANICS. Kier.

BIOL 565 CONSERVATION BIOLOGY. White.

BIOL 663 POPULATION ECOLOGY. Stiven.

BIOL 663L LABORATORY IN POPULATION ECOLOGY. Stiven.

BIOL 666 COMMUNITY AND SYSTEMS ECOLOGY. Riece.

BIOL 666L COMMUNITY AND SYSTEMS ECOLOGY LABORATORY. Riece.

ENVR 421 SOURCES, TRANSPORT AND FATE OF ENVIRONMENTALLY IMPORTANT MATERIALS. Staff.

ENVR 422 ENVIRONMENTAL MICROBIOLOGY. Pfaender.

ENVR 442 LIMNOLOGY AND WATER POLLUTION. Staff.

ENVR 522 CHEMICAL EQUILIBRIUM IN NATURAL WATERS. Johnson, Singer.

ENVR 523 ORGANIC MATERIALS IN NATURAL WATERS. Christman.

ENVR 524 ENVIRONMENTAL ANALYTICAL CHEMISTRY. Charles.

ENVR 770 BIOLOGY MONITORING. Pfaender.

GEOL 509 GROUNDWATER. Benninger.

GEOL 510 GEOCHEMISTRY OF NATURAL WATERS. Benninger.

GEOL 518 GEODYNAMICS. Rogers.

GEOL 519 HISTORY OF THE EARTH. Rogers.

GEOL 655 PHYSICAL GEOCHEMISTRY. Benninger.

GEOL 707 STRATIGRAPHIC PALEONTOLOGY: MESOZOIC CALCAREOUS NANNOFOSSILS.

GEOL 708 STRATIGRAPHIC PALEONTOLOGY: CENOZOIC CALCAREOUS NANNOFOSSILS.

MATH 523 FUNCTIONS OF A COMPLEX VARIABLE WITH APPLICATIONS. Cima.

MATH 524 ELEMENTARY DIFFERENTIAL EQUATIONS. Hawkins, Petersen, Murphy.

MATH 528 MATHEMATICAL MODELS FOR THE PHYSICAL SCIENCES I.

MATH 529 MATHEMATICAL MODELS FOR THE PHYSICAL SCIENCES II. Kerzman.

PHYS 301 MECHANICS I. Hernandez.

PHYS 341 HEAT AND THERMODYNAMICS. Wu.

Department of Mathematics

www.math.unc.edu
PATRICK EBERLEIN, *Chair*

Professors

Idris Assani (45) Dynamical Systems, Ergodic Theory of Operators
Roberto A. Camassa (16) Mathematical Modeling, Nonlinear Waves, Propagation, Dynamical Systems
Ivan V. Cherednik (48) Representation Theory, Mathematical Physics, Algebraic Combinatorics
Joseph A. Cima (4) Complex Analysis, Functional Analysis
James N. Damon (14) Singularity Theory, Differential Topology
Patrick B. Eberlein (6) Differential Geometry
M. Gregory Forest (7) Nonlinear Waves, Solitons, Fiber Flows of Complex Liquids
Sue E. Goodman (3) Topology, Dynamical Systems
Jane M. Hawkins (38) Ergodic Theory, Dynamical Systems
Christopher K. R. T. Jones (55) Applications of Dynamical Systems, Nonlinear Partial Differential Equations, Ocean Dynamics, Nonlinear Optics

Shrawan Kumar (46) Representation Theory, Geometry of Flag Varieties
Richard McLaughlin (50) Fluid Dynamics and Turbulent Transport
Michael L. Minion (11) Scientific Computation, Computational Fluid Dynamics, Adaptive Mesh Refinement
Karl E. Petersen (20) Ergodic Theory
Joseph F. Plante (23) Foliations, Dynamical Systems
Robert A. Proctor (43) Combinatorics, Representation Theory
Lev Rozansky (52) Three-Dimensional Topology
William W. Smith (25) Commutative Algebra
Michael E. Taylor (40) Partial Differential Equations, Harmonic Analysis, Operator Theory
Alexandre N. Varchenko (47) Geometry, Mathematical Physics
Jonathan M. Wahl (28) Algebraic Geometry
Mark Williams (36) Partial Differential Equations
Warren R. Wogen (29) Operator Theory

Associate Professors

David Adalsteinsson (1) Applied Mathematics and Scientific Computation
Prakash Belkale (57) Algebraic Geometry
Jingfang Huang (51) Integral Equation Methods and Fast Algorithms
Sorin Mitran (58) Computational Methods for Partial Differential Equations, Continuum-Kinetic Methods, Fluid Dynamics, Biological Fluid Dynamics and Mechanics
Peter Mucha (60), Fluid Dynamics, Suspensions, Sedimentation, Granular Flows, Rheology, Computer-Generated Animation, Networks
Richard Rimanyi (59), Topology, Geometry, Singularities

Assistant Professors

Jason Metcalfe (61) Partial Diffeential Equations
Dima Arinkin (62) Algebraic Geometry

Professors Emeriti

Robert L. Davis
Ladnor Gessinger
William H. Graves
Robert G. Heyneman
Norberto Kerzman
Ancel C. Mewborn
John Pfaltzgraff
Michael Schlessinger
Johann Sonner
James Stasheff

The Department of Mathematics offers graduate training leading to the degrees of master of arts, master of science, and doctor of philosophy. A master's degree may be included or bypassed in the doctoral program. All of a student's graduate work may be done within the department or, when appropriate, may be done under the direction of an approved adviser in an allied discipline. The M.A.T. degree is also available with an emphasis in mathematics in the School of Education.

The Department of Mathematics is housed in Phillips Hall, as are the Computation Center and the special library for the departments of Mathematics, Physics and Astronomy, Computer Science and Statistics. This departmental library contains an unusually large and complete collection of mathematical books and journals.

The Department of Mathematics offers a number of teaching assistantships and teaching fellowships each year. Applicants for financial aid are also considered for several University fellowships awarded by The Graduate School in the university-wide competition. Applications for admission and financial assistance may be obtained from The Graduate School. Applications for financial aid should be filed by December 31.

Degree Requirements

The general regulations of The Graduate School govern the work for graduate degrees in mathematics. Specific requirements are explained below. In general, a graduate student in mathematics may receive credit only for mathematics courses numbered 600 and above.

These descriptions summarize the requirements for the master's and Ph.D. degrees. More detailed statements may be obtained from the department. The director of graduate studies must approve all aspects of a student's program. The purpose of the graduate programs is to develop mathematical skills appropriate for competition in academia or industry.

The course schedule for all first-year students will depend upon each student's undergraduate training. The normal course load for a graduate student is three courses (nine credit hours) per semester. Graduate students must keep full time status in order to qualify for tuition and health insurance benefits. First-year students typically choose courses from five year-long sequences in algebra (676, 677), analysis (653, 656), geometry-topology (680, 681), scientific computation (661, 662) and methods of applied mathematics (668, 669). The Ph.D. comprehensive exams are based on the content of the first-year sequences. These exams are offered in January and August of each year, just before the semester begins. A Ph.D. student can pass either the Pure Math option or the Applied Math option for the qualifying examination. To pass the Pure Math option a student must pass any three of the five qualifying exams. To pass the Applied Math option, a student is required to pass Methods of Applied Math and Scientific Computation.

During the second year a typical Ph.D. student will take the Ph.D. comprehensive exams and select courses from a list of sixteen more advanced "second tier" courses. A typical master's student will complete that degree during the second year. The department considers two years to be the normal time needed to complete a master's degree.

A candidate for a master's degree must satisfy each of the following requirements:

1. Earn at least two semesters of residency credit and complete all requirements within five years.
2. Demonstrate computer programming ability by passing an approved undergraduate or graduate course in programming, or by passing an exam administered by the Mathematics Department.
3. Perform satisfactorily in 30 hours of graduate work in a program approved by the director of graduate studies. At least 15 of these hours must be in Mathematics Department courses numbered 600 or above.
4. Complete a master's project for a master of science degree or a master's thesis for a master of arts degree.
5. Pass an oral examination upon completion of the master's project or master's thesis. The exam will cover course work as well as the project or thesis.
6. For graduate students entering UNC-Chapel Hill in the fall 2001 semester or later, a master's candidate must pass one of the written comprehensive exams given to doctoral students.

A candidate for a Ph.D. degree must satisfy each of the following requirements:

1. Earn at least four semesters of residency credit and complete all requirements within eight years.
2. Satisfy the same computer programming requirement as a master's student.
3. Demonstrate reading competence in one approved foreign language by passing an approved course or by passing a translation exam administered by the Mathematics Department.

4. Complete either the Pure Math option or the Applied Math option for qualifying examinations by the beginning of the sixth semester.
5. Pass at least six courses from the following two lists: a) the second tier courses or b) first-year comprehensive courses not required for the three comprehensive exams the student has passed. Of these six courses at least three must be numbered over 700 and drawn from the second tier list.
6. Pass a preliminary oral exam on the chosen Ph.D. specialty area.
7. Write a Ph.D. thesis and defend it successfully during a final oral exam chaired by the thesis advisor.

The student/faculty ratio of about 3/2 makes it possible for graduate students to take reading courses from individual faculty members that are tailored to meet the student's needs.

Minor in Mathematics

Graduate students in other departments who plan to offer mathematics as a (complete or partial) minor field for the Ph.D. should consult the director of graduate studies in mathematics for approval of their programs and for assignment of an advisor in the Department of Mathematics. This should be done at the earliest possible time, in order to prevent disappointment for the student.

Courses for Graduates and Advanced Undergraduates

401 [101] MATHEMATICAL CONCEPTS IN ART (3). Mathematical theories of proportion, perspective (projective invariants and the mathematics of visual perception), symmetry and aesthetics will be expounded and illustrated by examples from painting, architecture and sculpture. (Alternate years.) Brylawski.

406 [106] MATHEMATICAL METHODS IN BIOSTATISTICS (1). Prerequisite, MATH 232 or equivalent. Special mathematical techniques in the theory and methods of biostatistics as related to the life sciences and public health. Includes brief review of calculus, selected topics from intermediate calculus and introductory matrix theory for applications in biostatistics. Fall.

411 [111] DEVELOPING MATHEMATICAL CONCEPTS (1–21). Permission of the instructor. An investigation of various ways elementary concepts in mathematics can be developed. Applications of the mathematics developed will be considered. Spring.

418 [118] BASIC CONCEPTS OF ANALYSIS FOR HIGH SCHOOL TEACHERS (3). Prerequisites, MATH 233 and 381. An examination of high school mathematics from an advanced perspective, including number systems and the behavior of functions and equations. Designed primarily for prospective or practicing high school teachers. Summer.

452 [107] MATHEMATICAL AND COMPUTATIONAL MODELS IN BIOLOGY (BIOL 452) (4). Prerequisites, BIOL 201 and 202, MATH 231, and either MATH 232 or STOR 155. This course will introduce analytical, computational, and statistical techniques, such as discrete models, numerical integration of ordinary differential equations and likelihood functions, to explore topics from various fields of biology. Laboratory is included.

515 [115] HISTORY OF MATHEMATICS (3). Prerequisite, MATH 381. A general survey of the history of mathematics with emphasis on elementary mathematics. Some special problems will be treated in depth. Spring.

521 [121] ADVANCED CALCULUS I (3). Prerequisites, MATH 233 and 381. The real numbers, continuity and differentiability of functions of one variable, infinite series, integration. Fall and spring.

522 [122] ADVANCED CALCULUS II (3). Prerequisites, MATH 383 and 521. Functions of several variables, the derivative as a linear transformation, inverse and implicit function theorems, multiple integration. Spring.

523 [123] FUNCTIONS OF A COMPLEX VARIABLE WITH APPLICATIONS (3). Prerequisite, MATH 383. The algebra of complex numbers, elementary functions and their mapping properties, complex limits, power series, analytic functions, contour integrals, Cauchy's theorem and formulae, Laurent series and residue calculus, elementary conformal mapping and boundary value problems, Poisson integral formula for the disk and the half plane. Spring.

524 [124] ELEMENTARY DIFFERENTIAL EQUATIONS (3). Prerequisite, MATH 383. Linear differential equations, power series solutions, Laplace transforms, numerical methods. Fall and spring.

528 [128] MATHEMATICAL METHODS FOR THE PHYSICAL SCIENCES I (3). Prerequisites, MATH 383 and PHYS 104 and 105, or equivalent. Theory and applications of Laplace transform, Fourier series and transform, Sturm-Liouville problems. Students will be expected to do some numerical calculations on either a programmable calculator or a computer. Fall.

529 [129] MATHEMATICAL METHODS FOR THE PHYSICAL SCIENCES II (3). Prerequisites, PHYS 104 and 105, and one of MATH 521, 524, or 528 or equivalents. Introduction to boundary value problems for the diffusion, Laplace and wave partial differential equations. Bessel functions and Legendre functions. Introduction to complex variables including the calculus of residues. Spring.

533 [133] ELEMENTARY THEORY OF NUMBERS (3). Prerequisite, MATH 381. Divisibility, Euclidean algorithm, congruences, residue classes, Euler's function, primitive roots, Chinese remainder theorem, quadratic residues, number-theoretic functions, Farey and continued fractions, Gaussian integers. Fall and spring.

534 [134] ELEMENTS OF MODERN ALGEBRA (3). Prerequisite, MATH 381. Binary operations, groups, subgroups, cosets, quotient groups, rings, polynomials. Fall and spring.

535 [126] INTRODUCTION TO PROBABILITY (STOR 435) (3). Prerequisite, MATH 233. Introduction to mathematical theory of probability covering random variables; moments; binomial, Poisson, normal and related distributions; generating functions; sums and sequences of random variables; and statistical applications. Fall and spring.

547 [147] LINEAR ALGEBRA FOR APPLICATIONS (3). Prerequisite, MATH 233 or 283. Algebra of matrices with applications: determinants, solution of linear systems by Gaussian elimination, Gram-Schmidt procedure, eigenvalues. MATH 416 may not be taken for credit after credit has been granted for MATH 547. Fall, spring and summer.

548 [148] COMBINATORIAL MATHEMATICS (3). Prerequisite, MATH 381 or equivalent, or permission of the instructor. Topics chosen from generating functions, Polya's theory of counting, partial orderings and incidence algebras, principle of inclusion-exclusion, Moebius inversion, combinatorial problems in physics and other branches of science. Fall.

550 [130] TOPOLOGY (3). Prerequisite, MATH 233; corequisite, MATH 383 or permission of the instructor. Introduction to topics in topology, particularly surface topology, including classification of compact surfaces, Euler characteristic, orientability, vector fields on surfaces, tessellations and fundamental group. Spring.

551 [131] EUCLIDEAN AND NON-EUCLIDEAN GEOMETRIES (3). Prerequisite, MATH 381 or permission of the instructor. Critical study of basic notions and models of Euclidean and non-Euclidean geometries: order, congruence and distance. Summer and spring.

555 [155] INTRODUCTION TO DYNAMICS (3). Prerequisite, MATH 383 or permission of the instructor. Topics will vary and may include iteration of maps, orbits, periodic points, attractors, symbolic dynamics, bifurcations, fractal sets, chaotic systems, systems arising from differential equations, iterated function systems and applications.

564 [145] MATHEMATICAL MODELING (3). Prerequisites, MATH 283 or 383, and some knowledge of computer programming or permission of the instructor. Model validation and numerical simulations using differential equations, probability and iterated maps. Applications may include conservation laws,

dynamics, mixing, geophysical flows and climate change, fluid motion, epidemics, ecological models, population biology, cell biology and neuron dynamics.

565 [125] COMPUTER ASSISTED MATHEMATICAL PROBLEM SOLVING (3). Prerequisite, MATH 383. Personal computer as tool in solving a variety of mathematical problems, e.g., finding roots of equations and approximate solutions to differential equations. Introduction to appropriate programming language; emphasis on graphics. Fall.

566 [166] INTRODUCTION TO NUMERICAL ANALYSIS (3). Prerequisites, MATH 383 and some knowledge of computer programming. Iterative methods, interpolation, polynomial and spline approximations, numerical differentiation and integration, numerical solution of ordinary and partial differential equations. Fall.

577 [137] LINEAR ALGEBRA (3). Prerequisites, MATH 381 and 383. Vector spaces, linear transformations, duality, diagonalization, primary and cyclic decomposition, Jordan canonical form, inner product spaces, orthogonal reduction of symmetric matrices, spectral theorem, bilinear forms, multilinear functions. A much more abstract course than MATH 416 or 547. Fall and spring.

578 [138] ALGEBRAIC STRUCTURES (3). Prerequisite, MATH 547 or 577. Permutation groups, matrix groups, groups of linear transformations, symmetry groups; finite abelian groups. Residue class rings, algebra of matrices, linear maps and polynomials. Real and complex numbers, rational functions, quadratic fields, finite fields. Fall.

579 [157] TOPICS IN MATRIX THEORY (3). Prerequisites, MATH 547 or 577 or equivalent, and some knowledge of computer programming. Quadratic and Hermitian forms, Sylvester's theorem; applications to systems of differential equations; approximation of eigenvalues and eigenvectors; non-negative matrices. Perron-Frobenius theorem; integer matrices with applications in combinatorics. Spring.

590 [175] TOPICS IN ANALYSIS (3). Prerequisite, MATH 522 or permission of the instructor. Topics may include linear spaces, convexity, mathematical programming, duality, algorithms or other subjects related to mathematical analysis. Fall.

591 [176] TOPICS IN ALGEBRA (3). Permission of the instructor. Topics may include number theory, algebraic number theory, field theory, or algebraic geometry.

592 [177] TOPICS IN GEOMETRY (3). Permission of the instructor. Topics may include non-Euclidean geometries, linear geometry, finite geometries, convexity, polytopes, topology and algebraic geometry.

635 [195] PROBABILITY (STOR 635) (3). Prerequisite, STAT 634 or permission of the instructor. Foundations of probability theory. Basic classical theorems. Modes of probabilistic convergence. Central limit problem. Generating functions, characteristic functions. Introduction to stochastic processes. Spring.

641 [189] ENUMERATIVE COMBINATORICS (3). Prerequisite, MATH 578. Basic counting; partitions; recursions and generating functions; signed enumeration; counting with respect to symmetry, plane partitions and tableaux.

643 [190] COMBINATORIAL STRUCTURES (3). Prerequisite, MATH 578. Graph theory, matchings, Ramsey theory, extremal set theory, network flows, lattices, Moebius inversion, q-analogs, combinatorial and projective geometries, codes and designs.

653 [193] INTRODUCTORY ANALYSIS (3). Prerequisite, advanced calculus. Elementary metric space topology, continuous functions, differentiation of vector-valued functions, implicit and inverse function theorems. Topics from Weierstrass theorem, existence and uniqueness theorems for differential equations, series of functions. Fall.

656 [196] COMPLEX ANALYSIS (3). Prerequisite, MATH 653. A rigorous treatment of complex integration, including the Cauchy theory. Elementary special functions, power series, local behavior of analytic functions. Spring.

657 [197] QUALITATIVE THEORY OF DIFFERENTIAL EQUATIONS (3). Prerequisites, linear algebra and MATH 653, or permission of the instructor. Existence and uniqueness theorems, linear and nonlinear systems, differential equations in the plane and on surfaces, Poincare-Bendixson theory, Lyapunov stability and structural stability, critical point analysis. Spring.

661 [191] SCIENTIFIC COMPUTATION I (ENVR 661) (3). Prerequisites, some programming experience and basic numerical analysis. Error in computation, solutions of nonlinear equations, interpolation, approximation of functions, Fourier methods, numerical integration and differentiation, introduction to numerical solution of ODEs, Gaussian elimination. Fall.

662 [192] SCIENTIFIC COMPUTATION II (COMP 662, ENVR 662) (3). Prerequisite, MATH 661. Theory and practical issues arising in linear algebra problems derived from physical applications, e.g., discretization of ODEs and PDEs. Linear systems, linear least squares, eigenvalue problems, singular value decomposition. Spring.

668 [198] METHODS OF APPLIED MATHEMATICS I (ENVR 668) (3). Prerequisite, undergraduate differential equations. Contour integration, asymptotic expansions, steepest descent/stationary phase methods, special functions arising in physical applications, elliptic and theta functions, elementary bifurcation theory. Fall.

669 [199] METHODS OF APPLIED MATHEMATICS II (ENVR 669) (3). Prerequisite, MATH 668 or permission of the instructor. Perturbation methods for ODEs and PDEs, WKBJ method, averaging and modulation theory for linear and nonlinear wave equations, long-time asymptotics of Fourier integral representations of PDEs, Green's functions, dynamical systems tools. Spring.

676 [186] MODULES, LINEAR ALGEBRA AND GROUPS (3). Modules over rings, canonical forms for linear operators and bilinear forms, multilinear algebra, groups and group actions. Fall.

677 [187] GROUPS, REPRESENTATIONS AND FIELDS (3). Internal structure of groups, Sylow theorems, generators and relations, group representations, fields, Galois theory, category theory. Spring.

680 [180] GEOMETRY OF CURVES AND SURFACES (3). Prerequisite, advanced calculus. Topics include (curves) Frenet formulas, isoperimetric inequality, theorems of Crofton, Fenchel, Fary-Milnor; (surfaces) fundamental forms, Gaussian and mean curvature, special surfaces, geodesics, Gauss-Bonnet theorem. Fall.

681 [181] INTRODUCTORY TOPOLOGY (3). Prerequisites, MATH 653 and 676 or permission of the instructor. Topological spaces, connectedness, separation axioms, product spaces, extension theorems. Classification of surfaces, fundamental group, covering spaces. Spring.

751 [201] INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS (3). Prerequisite, MATH 653. Basic methods in partial differential equations. Topics may include: Cauchy-Kowalewski Theorem, Holmgren's Uniqueness Theorem, Laplace's equation, Maximum Principle, Dirichlet problem, harmonic functions, wave equation, heat equation.

753 [203] MEASURE AND INTEGRATION (3). Prerequisite, MATH 653 or consent of the instructor. Lebesgue and abstract measure and integration, convergence theorems, differentiation, Radon-Nikodym theorem, product measures, Fubini theorem, Lebesgue spaces, invariance under transformations, Haar measure and convolution. Fall.

754 [204] INTRODUCTORY FUNCTIONAL ANALYSIS (3). Prerequisite, MATH 753. Hahn-Banach and separation theorems. Normed and locally convex spaces, duals of spaces and maps, weak topologies; closed graph and open mapping theorems, uniform boundedness theorem, linear operators. Spring.

755 [205] ADVANCED COMPLEX ANALYSIS (3). Prerequisite, MATH 656. Laurent series; Mittag-Leffler and Weierstrass Theorems; Riemann mapping theorem; Runge's theorem; additional topics chosen from: harmonic, elliptic, univalent, entire, meromorphic functions; Dirichlet problem; Riemann surfaces. Fall.

756 [206] SEVERAL COMPLEX VARIABLES (3). Prerequisite, MATH 656. Elementary theory, the Cousin problems, domains of holomorphy, Runge domains and polynomial approximation, local theory, complex analytic structures, coherent analytic sheaves and Stein manifolds, Cartan's theorems. Spring. (Alternate years.)

761 [221] NUMERICAL ODE/PDE, I (ENVR 761, MASC 781) (3). Prerequisites, MATH 661 and 662. Single, multistep methods for ODEs: stability regions, the root condition; stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations. Fall.

762 [222] NUMERICAL ODE/PDE, II (ENVR 762, MASC 782) (3). Prerequisite, MATH 761. Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation law methods (Lax-Fiedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Spring.

768 [228] MATHEMATICAL MODELING I (ENVR 763, MASC 783) (3). Prerequisites, MATH 668, 669, 661 and 662. Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; derivation of classical models of fluid mechanics (lubrication, slender filament, thin films, Stokes flow); derivation of weakly nonlinear envelope equations. Fall.

769 [229] MATHEMATICAL MODELING II (ENVR 764, MASC 784) (3). Prerequisites, MATH 668, 669, 661 and 662. Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs); geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Spring.

771 [231] COMMUTATIVE ALGEBRA (3). Prerequisite, MATH 677. Field extensions, integral ring extensions, Nullstellensatz and normalization theorem, derivations and separability, local rings, valuations, completions, filtrations and graded rings, dimension theory. Spring.

773 [273] LIE GROUPS (3). Prerequisites, MATH 676 and 781. Lie groups, closed subgroups, Lie algebra of a Lie group, exponential map, compact groups, Haar measure, orthogonality relations, Peter-Weyl theorem, maximal torus, representations, Weyl character formula, homogeneous spaces. Spring.

774 [274] LIE ALGEBRAS (3). Prerequisite, MATH 676. Nilpotent, solvable, and semisimple Lie algebras, structure theorems, root systems, Weyl groups, weights, classification of semisimple Lie algebras and their finite dimensional representations, character formulas. Fall.

775 [257] ALGEBRAIC GEOMETRY (3). Prerequisite, MATH 771. Topics may include: algebraic varieties, algebraic functions, abelian varieties, projective and complete varieties, algebraic groups, schemes and the Grothendieck theory, Riemann-Roch theorem. Spring. (Alternate years.)

776 [286] ALGEBRAIC TOPOLOGY (3). Prerequisites, MATH 681 and 676. Homotopy and homology; simplicial complexes and singular homology; other topics may include cohomology, universal coefficient theorems, higher homotopy groups, fibre spaces. Spring.

781 [271] DIFFERENTIABLE MANIFOLDS (3). Prerequisites, MATH 681, 676, and 653. Calculus on manifolds, vector bundles, vector fields and differential equations, Lie Groups, connections, de Rham cohomology. Fall.

782 [272] DIFFERENTIAL GEOMETRY (3). Prerequisite, MATH 781. Riemannian geometry, first and second variation of area and applications, effect of curvature on homology and homotopy, Chern-Weil theory of characteristic classes, Chern-Gauss-Bonnet theorem. Spring.

853 [224] HARMONIC ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include topological groups, abstract harmonic analysis, Fourier analysis, noncommutative harmonic analysis and group representation, automorphic forms and analytic number theory. Fall. (Alternate years.)

854 [213] ADVANCED FUNCTIONAL ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include operator theory on Hilbert space, operators on Banach spaces, locally convex spaces, vector measures, Banach algebras. Spring. (Alternate years.)

857 [261] THEORY OF DYNAMICAL SYSTEMS (3). Prerequisite, consent of the instructor. Topics may include: ergodic theory, topological dynamics, stability theory of differential equations, classical dynamical systems, differentiable dynamics.

891 [210] SPECIAL TOPICS (1–3). Permission of the instructor. Advance topics in current research in statistics and operations research. Spring.

892 [215] TOPICS IN COMPUTATIONAL MATHEMATICS (3). Prerequisites, MATH 661 and 662. Topics may include: finite element method; numerical methods for hyperbolic conservation laws, infinite dimensional optimization problems, variational inequalities, inverse problems. Spring.

893 [234] TOPICS IN ALGEBRA (3). Prerequisite, MATH 677. Topics from the theory of rings, theory of bialgebras, homological algebra, algebraic number theory, categories and functions.

894 [253] TOPICS IN COMBINATORIAL MATHEMATICS (3). Prerequisite, MATH 642 or consent of the instructor. Topics may include: combinatorial geometries, coloring and the critical problem, the bracket algebra, reduced incidence algebras and generating functions, binomial enumeration, designs, valuation module of a lattice, lattice theory. Spring. (Alternate years.)

895 [277] SPECIAL TOPICS IN GEOMETRY (3 each). Prerequisite, MATH 781. Topics may include elliptic operators, complex manifolds, exterior differential systems, homogeneous spaces, integral geometry, submanifolds of Euclidean space, geometrical aspects of mathematical physics. Fall. (Alternate years.)

896 [287] TOPICS IN ALGEBRAIC TOPOLOGY (3). Prerequisite, MATH 776 or permission of the instructor. Topics primarily from algebraic or differential topology, such as cohomology operations, homotopy groups, fibre bundles, spectral sequences, K-theory, cobordism, Morse Theory, surgery, topology of singularities. Fall and spring. (Alternate years.)

920 [390] SEMINAR AND DIRECTED READINGS (1–3).

921 [391] SEMINAR (3).

992 [392] MASTER'S PROJECT (3 or more).

993 [393] MASTER'S THESIS (3 or more). (This should not be taken by students electing nonthesis master's projects.)

994[394] DOCTORAL DISSERTATION (3 or more).

Department of Microbiology and Immunology

microimm.med.unc.edu

WILLIAM E. GOLDMAN, *Chair*

Professors

Steven L. Bachenheimer (30) Molecular Biology of Viruses

*Ralph Baric (76) Molecular Mechanisms of Virus Cross-Species Transmissibility and Pathogenesis

Robert Bourret (64) Signal Transduction in Bacteria, Chemotaxis

Janne G. Cannon (43) Genetics of Pathogens, Pathogenesis of Infectious Disease, Tularemia and Melioidosis

Stephen H. Clarke (53) Molecular Immunology, Structure and Function of Immunoglobin Genes

*Myron S. Cohen (55) Biology and Epidemiology of Transmission of STD Pathogens (including HIV)

*Jeff Dangl (87) Plant Genetics, Plant Disease Resistance and Cell Death Control, Bacterial Type III Secretion Systems

Marshall H. Edgell (7) Molecular Biology, Protein Biophysics, High Throughput

Analyses, Physical Bases for Allostery
Susan A. Fiscus (65) HIV Pathogenesis and Diagnostics
Jeffrey A. Frelinger (47) Immunogenetics, Cellular Immunology, Immunoresponse to Pathogens
Peter H. Gilligan (51) Bacterial Toxins, Clinical Microbiology
Jack Griffith (35) Chromosome Structure: Viruses and Their Host Cells
William E. Goldman, Pathogenesis of Respiratory Tract Infections: Histoplasmosis, Pertussis and Plague
*Nortin M. Hadler (26) Mechanism and Control of Chronic Inflammatory Response
*Eng-Shang Huang (48) Molecular Biology, Pathogenesis of Human Cytomegalovirus
Robert E. Johnston (62) Molecular Genetics of Viral Pathogenesis, Recombinant Viral Vaccines
David G. Klapper (33) Immunochemistry, Development of Protein Technology, Structure of Proteins of Immunologic Interest
*Zhi Liu (91) Biochemistry, Cell Biology, and Immunology of Hemidesmosome and Basement Membrane
*David A. Margolis, Regulation of Gene Expression, Molecular Biology of Retroviruses, HIV Pathogenesis
*Steven R. Meshnick (81) Malaria and Pneumocystis, Molecular Epidemiology, Pathogenesis, Drug Resistance
*Virginia L. Miller: Molecular and Genetic Analysis of Microbial Pathogenesis, Virulence Gene Regulation, Host-Pathogen Interactions
John E. Newbold (13) Molecular Virology
*Joseph S. Pagano (14) Epstein-Barr Virus and Ubiquitin-Proteasomal Systems, Interferon Regulatory Factors, Invasion and Metastasis and Antiviral Drugs
*Dhavalkumar Patel, Inflammation, Chemotaxis, GPCR Signal Transduction
Nancy Raab-Traub (52) Molecular Virology and Oncogenesis
*Howard M. Reisner (32) Immunogenetics of Human Plasma Proteins (particularly IgG and Coagulant Factors VII and IX)
*R. Balfour Sartor (77) Etiology and Pathogenesis of Inflammatory Bowel Disease (especially Crohn's Disease and Associated Extraintestinal Manifestations)
*P. Frederick Sparling (18) Bacterial Pathogenesis, Molecular Biology of Bacterial Membranes
Lishan Su (71) Immune Development, Viral Pathogenesis
*Ronald Swanstrom (74) Molecular Biology and Pathogenesis of HIV
Jenny P. Ting (50) Molecular Immunology, Transcription, Signal Transduction, Apoptosis, Neuroimmunology, Transplantation
Roland Tisch (70) Immune Tolerance, T-Cell Antigen Recognition, T-Cell Mediated Autoimmunity, Tumor Antigen-Specific Genetic Vaccines, Type 1 Diabetes
*William J. Yount (25) Genetic Control of Antibody Response and Gamma Globulin Synthesis in Humans

Associate Professors

*Christina Burch, Experimental Studies of Evolution using Viruses
*Bruce Cairns, Immune Response to Injury, Cellular Immunology, Transplantation
Edward J. Collins (69) Immune Recognition, T-Cell Activation, Host-Pathogen Interactions
Blossom Damania (79) Kaposi's Sarcoma-Associated Herpesvirus (KSHV/HHV-8), Rhesus Monkey Rhadinovirus (RRV)
Aravinda de Silva (73) Arthropod Vector-Borne Infectious Diseases and Microbial Pathogenesis
Dirk Dittmer (88) West Nile Virus (WNV) and Kaposi's Sarcoma-Associated Herpesvirus (KSHV/HHV-8)
*Patrick M. Flood (60) T-Cell Biology, Tumor Immunity, Neuroimmunology
Jean Handy (37) Virus Infection and Host Nutrition
Tal Kafri, Development of HIV-Based Vector for Gene Therapy
Thomas Kawula (63) Bacterial Genetics, Microbial Pathogenesis
*Silva Markovic-Plese, Autoimmune Response in Multiple Sclerosis, New Immunomodulatory Therapies
Glenn Matsushima (68) Molecular Neuroimmunology, Innate Immunity
Raymond Pickles (86) Respiratory Viruses, Host Innate Defense in the Airway, Virus-Host Cell Interactions, Gene Therapy for Cystic Fibrosis and Other Lung Diseases
*Plevy, Scott (92) Inflammatory Bowel Disease Research and Treatment
*Jonathan Serody (82) Transplantation and Tumor Immunology
Barbara J. Vilen (78) Molecular Immunology, Signal Transduction, and B cell Tolerance
*Jennifer Webster-Cyriaque (84) Oral Manifestations of Systemic Disease, Host-Virus Interactions, Viral Oncogenesis, Viral Pathogenesis during Immunosuppression, Signal Transduction, Cellular Biology, Gene Expression

Assistant Professors

Miriam Braunstein (80) Bacterial Pathogenesis, Molecular Genetics, Tuberculosis
Morgan Giddings (85) Bioinformatics, Proteomics, Post-Genomic Complexity, Cellular Modeling, Bacterial Pathogenesis
*Mark Heise (83) Molecular Genetics of Viral Pathogenesis
Matthew C. Wolfgang (89) Microbial Pathogenesis, Bacterial Gene Regulation, Host-Pathogen Interactions

Research Professors

Larry Arnold, Flow Cytometry, Immunogenetics
Nancy L. Davis (66) Molecular Genetics of Viral Pathogenesis, Recombinant Viral Vaccines

Research Associate Professors

*Christopher Elkins, Bacterial Pathogenesis, Iron Acquisition
*Marcia M. Hobbs, Pathogenesis of Non-Viral Sexually Transmitted Infections (Trichomonas Vaginalis, Neisseria Gonorrhoeae) and Molecular Diagnostics

Research Assistant Professors

W. June Brickey, Host Immune Responses, Expression Profiling by Microarrays
Patrick Harrington, Virology, Vaccine Design
John Lich
Alexander Makhov
*Robert Maile, Cellular Immunology, Burn Immunology, Transplantation, T Cell Regulation, Bacterial and Viral Infectivity.
Karen McKinnon, Dendritic Cell Induction of Tumor Specific CD4 and CD8 T Lymphocytes
Julie A.E. Nelson, Molecular Virology, HIV Evolution and Pathogenesis, HCV Co-infection, HIV Assay Development
Ruth Silversmith, Bacterial Chemotaxis, Mechanisms of Phosphotransfer Reactions
Debra J. Taxman, Molecular Immunology, Signal Transduction, Transcription, RNA Interference

Professors Emeriti

Kenneth F. Bott
William J. Cromartie
Harry Gooder
Clyde A. Hutchison III
G. Philip Manire
John H. Schwab
Myron S. Silverman
Robert Twarog
* *joint faculty members*

The Department of Microbiology and Immunology, an administrative division of the School of Medicine, is a unit of The Graduate School. It offers instruction leading to the doctor of philosophy degree. A terminal master of science degree is granted only under special conditions. Research in the department, supported by funds from the University, the National Institutes of Health, the National Science Foundation, the American Cancer Society, private foundations and other granting agencies, focuses on a wide variety of molecularly oriented projects. Areas

of investigation include the nature of bacteria and viruses, host-parasite interactions, pathogenic mechanisms, molecular genetics, various areas of immunology, eukaryotic cell and molecular biology, and bioinformatics.

For detailed information, visit the department's Web site at microimm.med.unc.edu.

Facilities

The department occupies approximately 33,000 square feet of the Mary Ellen Jones laboratory office building. A significant number of faculty who hold primary appointments in the department have laboratories housed in the adjacent Lineberger Comprehensive Cancer Center, as well as other departments within the School of Medicine and the School of Public Health.

Major equipment available to laboratories includes high-resolution transmission electron microscopes, automated instrumentation for amino acid analysis and micro-protein sequencing, peptide and oligonucleotide synthesizers, high-pressure liquid chromatography systems, fluorescence-activated cell sorters and analyzers, magnetic cell separation equipment, digital fluorescence microscope and a phosphoimager.

Large, well-equipped research laboratories are supplemented by dedicated tissue culture facilities, darkrooms for X-ray film and photographic applications, warm and cold rooms, supervised animal care facilities and a P3 physical containment facility for viral research.

The department also contains computer facilities with connections to the Medical Center computer system, which provides access to several sequence comparison programs, including GCG sequence analysis package.

In addition, the University provides access to major technology core facilities with major equipment and expertise, including genomics, NMR, animal histopathology, oligonucleotide synthesis, proteomics, X-ray crystallography, vectors, bioinformatics, animal models (transgenic mouse and embryonic stem cell services), DNA sequencing, gene chip, flow cytometry, confocal microscopy and mass spectrometry.

Admission Requirements

For admission into the Department of Microbiology and Immunology, students apply to the Biological and Biomedical Sciences Program (BBSP). This program is a common portal by which students interested in any of the 12 participating graduate programs will begin their graduate studies at UNC.

Students interested in applying to Microbiology and Immunology mayvisit www.med.unc.edu/bbsp, fill out the online application, and select Microbiology and Immunology as the first choice of interest. Students with broader interests may select other areas of interest.

If admitted, BBSP students will have the freedom to choose their three laboratory rotations and course work from any of the 12 participating graduate programs during the first year. Students are welcome to consult with the director of graduate studies at any time regarding microbiology and immunology course work and program details.

At the end of the first year, BBSP students will choose a research mentor/thesis advisor who is affiliated with the Department of Microbiology and Immunology and will become microbiology and immunology graduate students. Once in the program, students complete required course work and preliminary examinations, propose a research topic, choose a dissertation committee and engage in dissertation research.

Program of Study

The interdisciplinary Biological and Biomedical Sciences Program (BBSP) will advise for course work during the first year of study; however, if a student is focused in the microbiology and immunology discipline, it is recommended that the student take any of the following courses: Virology (MCRO 630), Microbial Pathogenesis I (MCRO 635), Microbial Pathogenesis II (MCRO 640) or Immunobiology (MCRO 614). Other courses recommended are Advanced Molecular Biology (MCRO 631/632) or Cell Biology (MCRO 643/644).

In year two, students begin formal training in the Department of Microbiology and Immunology. Specific courses taken by each student may vary depending on interest and background. Graduate courses in the departments of Cell and Developmental Biology, Chemistry, Biochemistry, Pathology, and other departments are available for those students seeking special preparation in these areas. In all, students are required to take a minimum of six courses; at least two of the courses must be seminar tutorials. There is no language requirement. There is also a written preliminary examination, which is in the form of an NIH-style grant, and an oral examination, both of which stress written and oral command of selected scientific disciplines, rather than a broad comprehensive test of the field. Lastly, two semesters of teaching assistantships are part of the program.

During subsequent years, students focus on the execution of an independent research project under the guidance of a faculty advisor. It is expected that the student will provide an annual student seminar and continue to attend the departmental seminar series. Finally, award of the Ph.D. degree is a result of publications, a written dissertation, public presentation, an oral defense of the student's work and knowledge and a final submission to The Graduate School. Most students complete the work for the Ph.D. in five to six years.

Financial Assistance

All students making satisfactory degree progress will receive an annual stipend plus in-state tuition, fees and health insurance. Funds are available from the department, the University and individual research grants; students are strongly encouraged to apply for a predoctoral fellowship from the Howard Hughes Medical Institute and/or the National Science Foundation.

Courses for Graduates and Advanced Undergraduates

515 [112] INTRODUCTION TO MICROBIOLOGY (4). Open only to dental students. A course covering basic aspects of microbiology and immunology including sterilization, action of antimicrobial chemotherapeutic agents, concepts of infection and immunity, and the study of certain selected infectious agents. Spring. Newbold, staff.

614 [114] IMMUNOBIOLOGY (3). Prerequisites, a strong background in molecular biology, eukaryotic genetics, and biochemistry, and permission of the instructor. Advanced survey course with topics that include molecular recognition, genetic mechanisms of host resistance, development of cells and cell interactions; hypersensitivity, autoimmunity and resistance to infection. Course material from textbook and primary literature. Fall. Collins, staff.

615 [115] SPECIAL TOPICS IN MICROBIOLOGY OR IMMUNOLOGY (three or more sections offered each semester) (1–21). Permission of the department except for department majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. Hours and credit to be arranged, any term. May be repeated for credit two or more semesters. Staff.

630 VIROLOGY (3). Prerequisites, molecular biology and cell biology. Current concepts of the chemistry, structure, replication, genetics and natural history of animal viruses and their host cells. Fall. Damania, Kafri, staff.

631 [108] ADVANCED MOLECULAR BIOLOGY I (BIOC 631, BIOL 631, GNET 631, PHCO 631) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics, and permission of the instructor. DNA structure, function and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair and genome fluidity. Three lecture hours a week. Fall. Griffith, Sancar, staff.

632 [109] ADVANCED MOLECULAR BIOLOGY II (BIOC 632, BIOL 632, GNET 632, PHCO 632) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics, and permission of the instructor. RNA structure, function and processing in biological systems including transcription, gene regulation, translation, proteins and RNA transport. Spring. Marzluff, Baldwin, Strahl, staff.

635 [135] MICROBIAL PATHOGENESIS I (3). Prerequisites, course work in molecular biology and genetics and permission of the instructor. Topics include bacterial physiology, genetics, signal transduction, gene regulation and the localization of proteins in bacteria. Fall . Staff.

640 [140] MICROBIAL PATHOGENESIS II (3). Prerequisites, a fundamental understanding of molecular virology and immunology and permission of the instructor. Molecular pathogenesis, with a primary focus on viral pathogens. Additional topics include vaccines and genetics of host-pathogen interactions. Spring. Staff.

643 [117] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (BIOC 643, CBIO 643, PHCO 643) (3). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. A comprehensive lecture- and discussion-based course covering research on membrane structure, membrane trafficking, the cytoskeleton, the extracellular matrix and ion channels. The final block of lectures will apply an understanding of these subjects to various hot topics in cell biology. Fall. Erickson.

644 [118] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (BIOC 644, CBIO 644, PHCO 644) (3). Prerequisites, undergraduate cell biology or biochemistry, or permission of instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Cox.

Courses for Graduates

701, 702 [201, 202] SEMINAR IN MICROBIOLOGY (1 each). Seminars on selected topics in microbiology. Fall and spring. Staff.

710 [210] SEMINAR/TUTORIAL IN PROKARYOTIC MOLECULAR BIOLOGY (1–21). One or two faculty and a small number of students will consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall. Staff.

711 [211] SEMINAR/TUTORIAL IN ANIMAL VIROLOGY (1–21). One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall. Staff.

712 [212] SEMINAR/TUTORIAL IN IMMUNOLOGY (1–21). One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall and spring. Staff.

790 [290] DIRECTED READINGS IN PROKARYOTIC MOLECULAR BIOLOGY (1). Prerequisite, one prior prokaryotic molecular biology course or permission of the instructor. Directed readings in prokaryotic molecular biology under the direction of a member of the graduate faculty. May be repeated for credit.

791 [291] DIRECTED READINGS IN VIROLOGY (1). Prerequisite, one prior virology course or permission of the instructor. Directed readings in virology under the direction of a member of the graduate faculty. May be repeated for credit.

792 [292] DIRECTED READINGS IN IMMUNOLOGY (1). Prerequisite, one prior immunology course or permission of the instructor. Directed readings in immunology under the direction of a member of the graduate faculty. May be repeated for credit.

795 [295] RESEARCH CONCEPTS (2). Prerequisite, permission of the instructor. This course will provide multiple opportunities for the student to write parts of hypothesis-based proposals, receive substantial feedback and to rewrite the text. There will be approximately 10 single-page writing assignments. Edgell, Bourret, Hobbs.

901 [301] RESEARCH IN BACTERIOLOGY OR IMMUNOLOGY (1–21). Permission of the department required. Designed to introduce the student to research methods and special techniques. Short-term problems are conducted with the advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any term. Staff.

993 [393] MASTER'S THESIS (3–6). Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Staff.

Department of Music

music.unc.edu
TIM CARTER, *Chair*
Annegret Fauser, *Director of Graduate Studies*

Professors

Mark Evan Bonds (006) Late 18th- and 19th-Century Music, Aesthetics
Tim Carter (003) Late 16th- and 17th-Century Music, Music and Theater, Analysis, American Musical Theater
Annegret Fauser (007) 19th- and 20th-Century Music, France, America, Women's and Gender Studies, Cultural Studies
Jon W. Finson (036) 19th-Century Music, American Music
Stefan Litwin (008) 20th-Century Music, Performance Practices
John L. Nádas (057) Late Medieval Music, Italian Opera
Severine Neff (012) 20th-Century Music and Theory

Associate Professors

Allen Anderson (004) Music Theory
Mark Katz (011) World Musical Technology, Popular Music, American Music
Anne MacNeil (008) 16th- and 17th-Century Music, Music and Theater, Gender Studies, Historiography
Jocelyn Neal (005) 20th-Century Theory, Popular Music

Adjunct Associate Professor

Philip Vandermeer (015) Traditional and American Popular Music

Assistant Professors

Brigid Cohen Music post World War II, Migrations and Diasporas
David Garcia (010) Latin American Music, Popular Music
Felix Wörner (014) History of Theory, 20th-Century Music

Lecturer

Marzanna Poplawska, World Music, Indonesia, Gamelan
Hana Vlhová-Wörner, Medieval Music

Degrees

The department offers the degrees of master of arts (M.A.) in musicology and the doctor of philosophy (Ph.D.) in musicology, construing "musicology" in its broad sense to encompass the interrelated disciplines of music history, music theory, ethnomusicology and studies of popular culture. The department also supports the School of Education's programs leading to the degrees of master of arts in teaching (M.A.T.), and doctor of education (Ed.D.) with a minor or special project in music; applications to these programs are made to the School of Education,

from which information is available. More detailed information on the Music Department's faculty and programs may be found on the department's Web site at music.unc.edu.

Special Facilities

Central to the departmental resources is the Music Library, which ranks high among the nation's music libraries for its scholarly editions, periodicals, early source materials, iconographic aids, microfilms, folk-music collections and recordings. The department also sponsors a research internship program in the Music Division at the Library of Congress.

Prerequisites for Degree Programs

The usual prerequisite for admission to graduate work leading to the M.A. and Ph.D. degrees is a bachelor of arts degree with a major in music, or a bachelor of music degree, comparable to those given at this university. All applicants for graduate study in music are required to take the departmental diagnostic exam and the verbal and quantitative aptitude tests of the Graduate Record Examination (GRE). The GRE should be taken early enough for the scores to be submitted with the application for admission, preferably in the summer or fall preceding application for admission. Applicants for the M.A. or the Ph.D. program must also submit with their application samples of their recent writing on musical subjects.

Language and Course Requirements, Examinations

M.A. candidates must either pass the departmental diagnostic examination in one modern foreign language or complete the fourth semester of the undergraduate language sequence in that language at UNC–Chapel Hill with a grade of B or better; Ph.D. candidates must demonstrate proficiency in two foreign languages in one of the two ways described above. M.A. candidates must fulfill departmental theory and keyboard proficiency requirements by examination, or by completing a series of specified undergraduate courses in the department with a grade of B or better. Students entering the Ph.D. program with a completed M.A. from another institution must also meet these theory and keyboard requirements as early in their course of study in the department as possible, and in any event, before they can advance to candidacy for the Ph.D.

MUSC 750 and 751 (Resources and Methods in Musicology I and II) are required of all M.A. students in their first and second semesters respectively, as is MUSC 992 (Master's Thesis) in the fourth semester. Other courses are drawn from a range of offerings comprising proseminars (repertory-, method- or issue-based studies) and seminars (on more precise topics normally requiring significant research on primary sources). Graduate students have the option to include courses from other departments that may be organized as a formal minor (nine hours for the MA, 15 for the Ph.D.) or as a supporting program. Courses taken outside the department must be approved in advance by the director of graduate studies in music and by the departments concerned as directly relevant to a proposed course of study.

M.A. candidates take courses totaling 30 credit hours and write a thesis that is a revision of a paper prepared for a graduate course taken in the music department. All candidates for a master's degree take a final oral examination covering course work; a final written examination is not given.

Students entering with an equivalent M.A. from another institution are required to take MUSC 750 and 751 (Resources and Methods in Musicology I and II) in their first two semesters respectively, in addition to four proseminars or seminars in the department at the graduate level during their first, probationary year.

At the beginning of each spring semester a qualifying examination is given to those who wish to proceed to the Ph.D. program after gaining the M.A. Students already in the department's M.A. program take the examination in the second year. Those who received the M.A. at another institution must take the examination in the spring of their first year of study.

Following the completion of an additional 12 hours of seminars above the 30 hours required for the M.A. and of language requirements, Ph.D. students take a written examination in three areas of specialization to be determined through consultation with the faculty and director of graduate studies in music, and an oral examination on a proposed dissertation topic. They then register for at least two semesters of MUSC 994 (Doctoral Dissertation), complete the dissertation and undergo a second oral examination in its defense.

More detailed explanation of these requirements appears in the Music Department's Graduate Handbook (music.unc.edu/grad/grad/grad_degree_info/grad_handbook/index_html).

Fellowships, Assistantships and Other Student Aid

In addition to campus-wide grants (discussed elsewhere in this Record), assistantships and special grants are available to selected graduate students in music. The deadline for all graduate applications is January 1; separate application for aid is not necessary but may be indicated on the general application form for admission to The Graduate School. Selected applicants are nominated for university-wide awards that range from $15,000 to $20,000. Teaching assistantships may be awarded by the department; these awards average $16,000 and usually include tuition remission for out-of-state students, payment of in-state tuition and other benefits.

Courses for Graduates

750 [101] RESOURCES AND METHODS OF MUSICOLOGY I (3). Introduction to the field of musicology, including its scope, methodology and bibliography. Taught in three-week modules, each directed by a different member of the academic faculty. Individual modules will include music history, music theory, ethnomusicology, music aesthetics and cultural studies. Fall.

751 [102] RESOURCES AND METHODS OF MUSICOLOGY II (3). Continuation of MUSC 750. Spring.

830 [248] PROSEMINAR IN MUSIC THEORY (3). Fall and spring.

850 [249] PROSEMINAR IN MUSICOLOGY (3). Fall and spring.

870 [250] PROSEMINAR IN ETHNOMUSICOLOGY (3). Fall and spring.

890 [298] SPECIAL STUDIES (1–21). The faculty assists and advises graduate students in work on particular research projects. Available to musicology graduate students only (M.A.T. students taking special studies must register under MUSC 471). Hours and credits to be arranged.

930 [336] SEMINAR IN MUSIC THEORY (3). Fall and spring.

950 [337] SEMINAR IN MUSICOLOGY (3). Fall and spring.

970 [338] SEMINAR IN ETHNOMUSICOLOGY (3). Fall and spring.

992 [393] MASTER'S THESIS (3). Fall and spring.

994 [394] DOCTORAL DISSERTATION (3). Fall and spring.

Curriculum in Neurobiology

www.med.unc.edu/neurobiology
ROBERT ROSENBERG, *Director*

Professors

Albert Baldwin, Regulation and Biological Functions of the Transcription Factor NF-kB and the Role of NF-kB in Disease, with a Particular Emphasis on Cancer and Cancer Therapy
George R. Breese (2) Cellular and Molecular Neurobiology, Neuropharmacology, Alcoholism, Neuroplasticity, Transcription Factors, RT/PCR Developmental Disorders, Neuropsychiatric Disorders
Regina M. Carelli (142) Behavioral Neurophysiology, Neurobiology of Drug Abuse, Brain Reward Systems
Fulton T. Crews (133) Molecular Aspects of Neuronal Vitality and Alcohol
Stephen T. Crews (129) Molecular Genetics of Drosophila Nervous System Development, Control of Neural Gene Regulation
Linda Dykstra (51) Behavioral Pharmacology, Opioid Analgesics, Opioid/Immune Interactions
Gregory K. Essick (106) Somatosensory Psychophysics and Neurophysiology
Patrick Flood, Periodontology
John H. Gilmore (137) Human Brain Development, Immune Regulation of Neurodevelopment, Schizophrenia
Susan Girdler, Women's health, neuroendocrine dysregulation in premenstrual dysphoric disorder (PMDD)
T. Kendall Harden (59) G-proteins, Phospholipase C, and Receptor-Mediated Regulation of Second Messenger Signaling; P2-purinergic Receptors
Mark Hollins (125) Somatosensory Information Processing, Tactile Perception, Pain
Anthony LaMantia (146) Inductive Signaling and Control of Gene Expression in the Developing Forebrain/Inductive Control of Genes Related to Neurological and Psychiatric Diseases
Jean M. Lauder (71) Neurotransmitters as Developmental Signals, Prenatal Exposure to Drugs of Abuse and Environmental Neurotoxins, Effects on Developing Neurotransmitter Systems
Kenneth Lohmann, Behavior, Sensory Physiology, Neuroethology and Conservation Biology of Animals That Live in the Ocean
P. Kay Lund (88) Growth Factors: Molecular Biology, Signal Transduction and Role in Nervous System during Development and Aging
Donald T. Lysle (122) Neuroimmunology, Learning Processes
Terry Magnusson, Mammalian Genetics, Genomics and Development of Mouse Models of Human Disease
Richard B. Mailman (82) Biochemical and Molecular Pharmacology of Dopamine Receptors, Molecular Drug Design
William Maixner (112) Pain Mechanisms and Analgesia
Patricia F. Maness (90) Cell Adhesion and Signal Transduction in Developing Neurons
Paul B. Manis (151) Cellular Basis of Auditory Information Processing in Brainstem and Cortex
Ken D. McCarthy (77) Neuronal-Glial Interactions Studied in Hippocampal Brain Slices Using Electrophysiology, Confocal Imaging, and Conditional Gene Knockout Mice
A. Leslie Morrow (121) Molecular Neurobiology of GABAA Receptors and Alcoholism
Robert A. Nicholas (147) Signaling and Targeting Pathways of P2Y Nucleotide Receptors
David Overstreet, Genetic Animal Models of Depression, Alcoholism and Anxiety Disorders
Cort A. Pedersen (91) Neuroendocrinology and Neuropharmacology of Parenting and Sexual Behavior, Behavioral and Psychological Role of Oxytocin and Vasopressin, Psychobiology of Postpartum Depression
Edward R. Perl (35) Functional Organization and Synaptic Mechanisms for Pain and Other Somatic Sensations
Mitchell J. Picker (128) Behavioral Pharmacology of Opioids, Drug Tolerance and Cross-Tolerance, Sex and Genetic Determinants of Opioid Sensitivity
Joseph Piven, Pathogenesis of Autism including Neural Mechanisms, Genetic Basis and Neuropsychological and Behavioral Phenotype
Robert L. Rosenberg (115) Regulation of Ion Channels
Bryan Roth, GPCR Structure and Function, Drug Discovery
Aldo Rustioni (50) Excitatory and Inhibitory Neurotransmitters in Somesthesis
Richard J. Samulski (135) Development of Viral Vectors for Brain Specific Gene Delivery
Robert Sealock (58) Cell Biology and Biochemistry of the Neuromuscular Junction, Dystrophin and Dystrophin-Associated Proteins
Richard Segal, Spatial Organization and Plastiticity of Lower Limb Muscle Activity
Paul G. Shinkman (41) Neural and Behavioral Plasticity in Sensory Systems, Cerebellar Mechanisms of Learning and Memory
William D. Snider (148) Developmental Regulation of Neuronal Growth Factors
Ann E. Stuart (76) Mechanisms and Control of Histamine Release and Re-uptake at Photoreceptor Synapses and Their Effect on Signal Transfer
Kathleen K. Sulik (131) Teratology, Embryology
Jenny P. Ting (105) Use of Murine Models to Study the Role and Regulation of Inflammatory Genes in Demyelination and Remyelination
Alex Tropsha, Methodologies and Software Tools for Computer-Assisted Drug Design
Terry A. Van Dyke (143) Cell Growth Regulation, Cancer, Gene Expression
Richard Weinberg, Supramolecular Organization of the Postsynaptic Density, Calcium Sources and Actin-Binding Proteins in Spines
Barry L. Whitsel (46) Somatosensory Mechanisms
R. Mark Wightman (118) Neurotransmitters, Dopamine Reward Exocytosis, Neurochemistry

Associate Professors

Eva Anton, Molecular Analysis of Neuronal Migration and Layer Formation in Cerebral Cortex
Aysenil Belger, Cortical Circuits Underlying Attention and Executive Function in the Human Brain
Manzoor Bhat, Genetic Dissection of Axon-Glial Interactions in Drosophila and Mice
Richard E. Cheney (136) Molecular Motors in the Nervous System, Cellular and Molecular Neurobiology of the Cytoskeleton
Luda Diatchenko, Human Genetic Variability of Pain Sensitivity and Pathophysiological Pain States
Michael F. Goy (111) Biochemistry and Physiology of Excitable Cells, Synapse Formation, Second Messenger Mechanisms in Signal Transduction, Epithelial Biology
Clyde W. Hodge (150) Neurobehavioral Pharmacology and Pharmacogenomics of Addiction
Lars Fredrik Jarskog, Molecular Mechanisms That Contribute to the Neuropathology of Schizophrenia
Josephine Johns, Behavioral Pharmacology, Toxicology, Teratology, Neuroendocrinology
Tal Kafri, Development of HIV-1 Vectors for Gene Therapy of Genetic Diseases Such As Hemophilia A and B
Darin Knapp, Physiology and Behavioral Aspects of the Alcohol Withdrawal Syndrome
Silva Markovic-Plese, Autoimmune Response in MS, New Immunomodulatory Therapies
Glenn K. Matsushima (139) Neuroimmunology, Function of Activated Microglia in Neurodegenerative Disease
David Siderovski, Signaling Scaffold Activities of rgs12 and rgs14 in Coordinating Heterotrimeric G-Protein
Todd Thiele, Neurobiology of Alcoholism
Juli Valtschanoff, Vanilloid Receptors in Nociception
Ellen R. Weiss (144) Regulation of G Protein Signaling Pathways, Visual Signal Transduction

Assistant Professors

Joyce Besheer, Neurobiological Mechanisms Underlying Alcoholism and Addiction
Jay Brenman, Neuronal Dendrite and Axon Morphologies

Mohanish Deshmukh, Neuronal Apoptosis
Leisa Glantz
Rita Fuchs-Lokensgard, Associative Learning and Memory in Cue-Induced Relapse to Drug Seeking
Joseph Hopfinger, Reflexive Attention Mechanisms, Spatiotemporal Analyses of Voluntary Attention, Attentional Control Mechanisms, Studies of Memory Mechanisms
David Huang, Pathophysiology of Stroke and Cellular Mechanisms of Neuroprotection
Xuemei Huang, Structural Basis for Parkinson's Signs and Symptoms; Etiologic Factors in Parkinson's Disease
Carl J. Malanga, Child Neurology, Movement Disorders
Carol Otey, Mechanisms of Cell Motility and Adhesion
Larysa Pevny, Neural Induction, Neurogenesis, SOX Proteins
Benjamin Philpot, Modification of the Cerebral Cortex by Sensory Experience
Franck Polleux, Identification of the Cues and Signaling Pathways Underlying the Development of Connections in the Mammalian Cerebral Cortex
Donita Robinson, Chemistry and Physiology of the Nucleus Accumbens
Paul Tiesinga, Biophysics of Cortical Information Processing
Mark Zylka, Molecules and Mechanisms for Pain

Research Professors

Jacqueline Crawley, Mouse Behavioral Phenotyping
Karamarie Fecho, Actute Inflammatory and Neuropathic Pain
Doug Fitzpatrick, Sound Localization Pathways
Chistina Grobin, Neuroactive Steroids in the Brain
Rick B. Meeker (107) Neuroendocrine Regulation, Glutamate Receptors, Mechanisms of AIDS Dementia
Richard Weinberg, Postsynaptic Mechanisms of Glutamatergic Transmission

The Neurobiology Curriculum of the University of North Carolina at Chapel Hill includes faculty from the departments of Cell Biology and Anatomy, Anesthesiology, Biochemistry and Biophysics, Biostatistics, Chemistry, Medicine, Neurology, Oral Biology, Oral Surgery, Pathology, Pharmacology, Cell and Molecular Physiology, Psychiatry, Psychology, Biology, Biomedical Engineering, Mathematics and from the Curriculum in Genetics and Molecular Biology and the Program in Molecular Biology and Biotechnology. The theme unifying members of these diverse departments is a desire to understand the mechanisms through which the nervous system functions. While sharing this fundamental interest in the nervous system, research techniques used by members of the curriculum are quite diverse and provide the student with the opportunity to master a wide variety of laboratory skills.

Graduate students working toward the Ph.D. in neurobiology must take NBIO 411, 412, 701 or 702, 710, 722 and 723, 850 and 994.

The minor in neurobiology consists of a minimum of 15 hours of courses selected from the list below with the approval of the director.

Fellowships, commensurate with usual grants-in-aid, are available to support graduate students who are working toward the Ph.D. degree under the direction of a faculty member in the neurobiology curriculum and who major in neurobiology. After the first year, graduate students receive travel awards to attend national scientific meetings.

Applicants are urged to complete their applications by January 1.

Courses for Graduates and Advanced Undergraduates

400 [101C] CONDITIONING AND LEARNING (PSYC 400) (3). Prerequisite, PSYC 222. A comprehensive survey of the methods, findings and theories of classical and operant conditioning. Students develop skills necessary to evaluate, integrate and summarize significant original literature. Fall. Eckerman.

401 [102B] BIOLOGICAL FOUNDATIONS OF BEHAVIOR (PSYC 401) (3). Prerequisite, PSYC 222 or BIOL 101. Ethological, genetic and physiological variables are studied in relation to their behavior effects. Fall and spring. Gariepy, Lysle.

402 [106B] PHYSIOLOGICAL PSYCHOLOGY (PSYC 402) (3). Prerequisite, PSYC 101, PSYC 220, or permission of the instructor. Elements of neurophysiology, neuroanatomy and neurochemistry as they apply to the understanding of brain-behavior relationships. (As announced.) Carelli.

411 [111], 412 [112] NEUROBIOLOGY LABORATORY APPRENTICESHIP (1–21). Prerequisite, permission of the director of training in the neurobiology curriculum. A laboratory-tutorial course to acquaint the student with methods used in several areas of neurobiology. Fall and spring. Faculty of the neurobiology curriculum.

450 [150] TUTORIAL IN NEUROBIOLOGY (3). Prerequisite, permission of the instructor. A tutorial in selected topics in neurobiology tailored to meet interests of the students and competencies of instructors. Fall and spring. Staff.

Courses for Graduates

701 [201A] BEHAVIOR AND ITS BIOLOGICAL BASES I (PSYC 701) (3). A survey of psychological and biological approaches to the study of sensory and perceptual information processing; perceptual development. Fall. Staff.

702 [202A] BEHAVIOR AND ITS BIOLOGICAL BASES II (PSYC 702) (3). A survey of psychological and biological approaches to the study of basic learning and higher integrative processing. Spring. Staff.

703 [204] ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (PSYC 703) (3). Prerequisite, PSYC 402 or equivalent. Each fall one specific topic is covered in depth; e.g., neural bases of memory storage, homeostasis and perception. Format includes lecture and seminar meetings with student presentations. Fall. Shinkman.

704 [207] APPLICATIONS OF EXPERIMENTAL PSYCHOLOGY TO HEALTH RESEARCH (PSYC 704) (3). This course provides a critical analysis of interdisciplinary research within experimental psychology, including such topics as psychopharmacology, psychoneuroimmunology, psychophysiology and animal models of brain/behavior disorders. Fall. Carelli, Dykstra, Girdler, Light, Lysle, Picker.

705 [323] BEHAVIORAL PHARMACOLOGY (PSYC 705, PHCO 705) (3). Prerequisite, PSYC 404 or permission of the instructor. Basic principles of pharmacology and behavior analysis are considered in relation to drugs that affect the central nervous system. Spring. Dykstra.

708 [302] SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (PSYC 708) (3). Prerequisite, permission of the instructor. Limited to graduate students in psychology and neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. Fall and spring. Carelli.

710 [210] MEDICAL NEUROBIOLOGY (PHYI 710) (3). Prerequisite, permission of the course director. A special segment of the neurobiology course for medical students (for neurobiology graduate students only). Structural and functional organization is analyzed at the level of the cell membrane, the neuron and integrated neuronal systems. Spring. Farel, staff.

722A [222A] CELLULAR AND MOLECULAR NEUROBIOLOGY: INTRODUCTION (BIOC 722A, PHCO 722A, PHYI 722A) (2). Prerequisite, permission of the course director. Introductory section covers basic neurobiology, including neuronal cell biology, action potentials, synaptic potentials, molecular biology and neuroanatomy. Course meets four weeks with six lecture hours per week. Fall. Stuart.

722B [222B] CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-RECEPTORS (BIOC 722B, PHCO 722B, PHYI 722B) (2). Prerequisite, permission of the instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for four weeks with six

lecture hours per week. Fall. Stuart.

722C [222C] CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (BIOC 722C, PHCO 722C, PHYI 722C) (2). Prerequisite, permission of the course director. The genesis of electrical impulses in the nervous system is considered with an emphasis on membrane potentials, voltage-gated ion channels, and structural features of neurons that influence coding. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

723A [223A] SYNAPTIC MECHANISMS AND INTRACELLULAR SIGNALING (BIOC 723A, PHCO 723A, PHYI 723A) (3). Prerequisite, permission of the course director. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tryosine kinases. Course meets for five weeks with six lecture hours per week. Spring. Stuart.

723B [223B] ANATOMY AND FUNCTION OF SENSORY AND MOTOR SYSTEMS (BIOC 723B, PHCO 723B, PHYI 723B) (3). Prerequisite, permission of the course director. Explores the mechanisms regulating the release of neurotransmitters from nerve terminals, including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Spring. Stuart, faculty.

723C [223C] CNS: ANATOMY AND FUNCTION (2). Prerequisite, permission of the course director. Neuroanatomy will examine the organization of human and animal brains for processing different sensory modalities, with emphases on anatomical techniques and relating structure to function.

724 [224] DEVELOPMENTAL NEUROBIOLOGY (PHYI 724) (3). Prerequisite, permission of the instructor. A survey of nervous system development emphasizing detailed analysis of selected research topics such as neural induction, neural crest development, neuronal differentiation, synapse formation, neurotrophic factors, glial development and the effects of experience. Spring. Perl.

725 [225] EXPERIMENTAL NEUROPHYSIOLOGY (3). Prerequisite, permission of the instructor. Six or more laboratory hours a week. On occasion. Staff of neurobiology curriculum.

728 [228] DISEASES OF THE NERVOUS SYSTEM (2). Prerequisites, NBIO 222 and 223 or NBIO 201. Explores the basic neurobiology and the clinical aspects of a range of diseases of the nervous system, including ALS, Alzheimer's, autism, schizophrenia, multiple sclerosis, deafness, epilepsy, pain, brain tumors, stroke, Parkinson's and other neurodegenerative diseases. Fall. Gilmore, Manis, staff.

729 [221] SENSORY NEURAL INFORMATION PROCESSING AND REPRESENTATION (3).

735 [235] SEMINAR IN CHEMICAL NEUROBIOLOGY (2). Prerequisite, two semesters of biochemistry. Fall. (Alternate years.) Morell.

850 [290] SEMINAR IN NEUROBIOLOGY (BIOL 850, PHYI 850, PHCO 850) (3). Prerequisite, permission of the director of the neurobiology curriculum. An intensive consideration of selected topics and problems in neurobiology. The course focuses on the development of presentation and evaluation skills of the trainees. Six credit hours required for neurobiology graduates. Spring. Faculty of the neurobiology curriculum.

857 [259] SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (BIOL 857) (2). Prerequisite, permission of the instructor. Fall or spring. Staff.

858 [260] SEMINAR IN COMPARATIVE PHYSIOLOGY (BIOL 858) (2). Prerequisite, BIOL 451 or permission of the instructor. Fall or spring. Staff.

891 [211], 892 [212] SPECIAL TOPICS IN PHYSIOLOGY (PHYI 891, 892) (1–5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of selected topics such as membrane function, transport physiology, renal physiology, etc. Fall and spring. Staff.

951 [310] RESEARCH IN NEUROBIOLOGY (PHCO 951, PHYI 951, BIOL 951) (3–12). Prerequisite, permission of a staff member. Research in various aspects of neurobiology. Six to 24 hours a week. Fall and spring. Faculty of the neurobiology curriculum.

994 [394] DOCTORAL DISSERTATION (Var.). Fall, spring and summer. Research advisor.

School of Nursing

nursing.unc.edu

LINDA R. CRONENWETT, *Dean*
Gwen Sherwood, *Associate Dean for Academic Affairs*
Jennifer D'Auria, *Director of Master's Programs*
Merle Mishel, *Director of Doctoral And Postdoctoral Programs*

Distinguished Professors

Barbara Mark (124) Health Care Environments
Merle Mishel (82) Adult and Geriatric Health
Mary H. Palmer (6) Adult and Geriatric Health
Margarete Sandelowski (64) Family Health

Professors

Linda Beeber (109) Health Care Environments
Linda R. Cronenwett (105) Health Care Environments
Catherine I. Fogel (4) Family Health
Sandra G. Funk (32) Research Division
Barbara Germino (49) Adult and Geriatric Health
Jean Goeppinger (89) Family Health
Donna Havens (123) Health Care Environments
Diane Kjervik (103) Health Care Environments
Mary Lynn (84) Health Care Environments
Marilynn Oermann (36) Adult and Geriatric Health
Gwen Sherwood (33) Adult and Geriatric Health
Anne Skelly (99) Family Health

Associate Professors

Barbara Carlson (113) Adult and Geriatric Health
Jennifer D'Auria (85) Family Health
Edward Halloran (79) Health Care Environments
Cheryl Jones (112) Health Care Environments
Deborah Mayer (28) Adult and Geriatric Health
Virginia J. Neelon (13) Adult and Geriatric Health
Pamela Rowsey (44) Adult and Geriatric Health
Suzanne Thoyre (45) Family Health
Marcia Van Riper (120) Family Health
SeonAe Yeo (108) Family Health

Assistant Professors

Debra Barksdale (122) Family Health
Anna Beeber (14) Adult and Geriatric Health
Diane Berry (130) Adult and Geriatric Health
Beth Black (42) Family Health
Susan Brunssen (125) Family Health
Noreen Esposito (118) Family Health
Jill Hamilton (15) Adult and Geriatric Health
Eric Hodges (16) Family Health
Mary Lynn Piven (110) Health Care Environments
Mi-Kyung Song (22) Adult and Geriatric Health
Theresa Swift-Scanlan (30) Adult and Geriatric Health
Debbie Travers (38) Health Care Environments

Emeriti Faculty

Eleanor M. Browning (14)
Barbara Bunker (15)
Margaret E. Campbell (16)

Laurel A. Copp (22)
Jo Ann Dalton (23)
Mary C. Dowe (31)
Molly C. Dougherty (104)
Margery Duffey (42)
Cynthia M. Freund (17)
Bonnie K. Hensley
Carol C. Hogue (65)
Margaret F. Hudson (10)
Betty H. Landsberger
Patricia Lawrence (11)
Nancy Milio (28)
Helen M. Murphy (25)
Susan Pierce (26)
Barbara C. Rynerson (19)
Ingrid Swenson
Eleanor Taggart

Master of Science in Nursing

The master of science in nursing (M.S.N.) program prepares nurses for advanced nursing practice with role preparation as a nurse practitioner, clinical nurse specialist and/or health care systems specialist.

Length of Program

The program of study varies from 39 to 42 credits of academic course work including clinical practice, an oral comprehensive examination, and a research project (or in some cases, a thesis). Students may pursue the M.S.N. degree on a full-time or part-time basis. Dual programs of study may be developed on an individual basis, but involve a longer program of study.

The Curriculum

The curriculum consists of four components: the professional core, the research core, the clinical core, and the advanced nursing practice specialty courses. The professional core courses (NURS 646, NURS 647) and research core courses (NURS 776, NURS 777, NURS 992 or 993) are required for all M.S.N. students. The clinical core courses and advanced practice area courses focus on the student's selected area of specialization and role preparation.

The specialty areas offered by the program reflect a combination of current practice trends as well as available faculty resources. Content in specialty areas and the types of areas of specialization offered are adjusted based on these factors. In some advanced practice specialty areas, electives in nursing or other disciplines or courses to support a focus area are required. Each student is admitted to a specific advanced practice area and a faculty advisor helps design a program of study that is appropriate to the student's educational and career goals. Upon completion of the program, students are eligible to sit for national certification examinations appropriate to their advanced nursing area of preparation.

The current advanced practice areas include adult nurse practitioner, health care systems (informatics, clinical nurse leader, outcomes management, administration, education), pediatric nurse practitioner/primary care, family nurse practitioner, psychiatric-mental health nursing, (clinical nurse specialist, and clinical nurse specialist-nurse practitioner) and women's health nurse practitioner. A community-oriented primary care option for working with undeserved and vulnerable populations is also available; this option requires an additional six to eight credits of course work beyond the 40 required hours in the master's program. In addition, for students in the health care systems informatics option, dual M.S.N./M.S.I.S. and M.S.N./M.S.L.S. degree options are available through the School of Nursing and the School of Information and Library Science. An up-to-date listing of the advanced practice areas being offered and detailed descriptions of the curriculum for each specialty area may be accessed through the School of Nursing home page (nursing.unc.edu); click on "Academic Programs."

Graduate Courses

NURS 642 [142] HEALTH PROMOTION AND ILLNESS PREVENTION IN ADVANCED NURSING (2). Focuses on the promotion of health, prevention of illness and identification of factors that impact health across the life span.

NURS 646 [146] HEALTH CARE POLICY IN THE U.S.: DEVELOPMENT, IMPACTS AND IMPLICATIONS FOR NURSES (3). Examines health care systems development, impacts and prospects for change. Content enables nurses to draw implications for nursing practice and advocacy for improving systems.

NURS 647 [147] APPROACHES TO ADVANCED PRACTICE INTEGRATING THEORIES, ROLES AND ISSUES (3). Examines the historical evolution, theoretical roots, current roles and context of advanced practice nursing. Content addresses the definition issues and scope of advanced practice nursing within a changing environment.

NURS 710 [200] DEVELOPMENTAL PHYSIOLOGY AND PATHOPHYSIOLOGY (3). Explores developmental changes in morphological processes and normal and pathologic physiology in humans from conception through adolescence. Physiological differences between infants and children and adults are emphasized.

NURS 715 [230] PATHOPHYSIOLOGY FOR ADVANCED NURSING PRACTICE (3). Examines the physiological and pathophysiological responses to injury-effects on cell function, host defense responses, maintenance of vital functions, and neuro-endocrine-immune responses.

NURS 720 [229] PHARMACOTHERAPEUTICS IN ADVANCED NURSING PRACTICE (3). Prerequisites, NURS 710 or NURS 715. Examines principles of pharmacotherapeutic decision making in advanced nursing practice with application to clinical management of common health problems specific to all age groups, encompassing a life-span approach.

NURS 721 PEDIATRIC PHARMACOLOGY (1). Prerequisites, NURS 715, NURS 720, or permission of faculty. The course will examine the principles of pharmacotherapeutic decision making in advanced nursing practice, with application to the clinical management of common health problems specific to pediatrics.

NURS 722 PSYCHOPHARMACOLOGY IN ADVANCED NURSING PRACTICE (1). Prerequisites, NURS 715, 720 (or concurrent) or permission of faculty. Examines the principles of neurobiology and psychopharmacology toward the prescribing and decision making of of advanced practice nurses, with application to clinical management of common health problems encompassing a life span approach.

NURS 725 [223] ADVANCED ASSESSMENT AND DIAGNOSTIC REASONING IN NEONATAL AND PEDIATRIC NURSING (4). Prerequisite or corequisite, NURS 710. Prepares the advanced practice neonatal/pediatric nurse to comprehensively assess neonates and children using a diagnostic reasoning process.

NURS 726 [226] ADVANCED HEALTH ASSESSMENT AND DIAGNOSTIC REASONING IN PRIMARY CARE NURSING (4). Prerequisite or corequisite, NURS 715. Examines the process of diagnostic reasoning as a framework to synthesize comprehensive assessment of adult patients. Course focuses on the clinical evaluation of common problems that are present in primary care settings.

NURS 727 [224] ADVANCED DIAGNOSTIC PROCESS IN PSYCHIATRIC/MENTAL HEALTH NURSING (4). Prerequisite or corequisite, NURS

715. Introduces students to the role of the advanced practice psychiatric/mental health nurse. Models for assessment, intervention and evaluation are explored and tested clinically.

NURS 776 RESEARCH FOR ADVANCED CLINICAL PRACTICE (3). Graduate standing. Successful completion of an undergraduate statistics course. This course explores approaches to research problems in advanced practice nursing. Theories, methods, designs, measurement, ethical conduct and skills in critical appraisal are emphasized.

NURS 777 INTERMEDIATE STATISTICAL APPLICATIONS IN HEALTH CARE (3). Graduate standing. This course provides an introduction to probability, statistical concepts and analytical techniques useful in health care research and for interpreting the literature.

NURS 810 [210] PRIMARY CARE MANAGEMENT OF ADULTS (3–4). Prerequisites, NURS 715, NURS 720; prerequisite or corequisite, NURS 726. Focuses on the management of illnesses common to young, middle and older adults in ambulatory care.

NURS 811 [213] SELECTED ISSUES IN ADULT HEALTH (4). Prerequisites, NURS 715, NURS 720, NURS 726, NURS 810, or permission of the instructor. Provides the opportunity for an in-depth examination of management strategies with selected health problems in adults. Also examines issues inherent in the management of women and elderly populations.

NURS 812 [255] MANAGEMENT OF COMPLEX HEALTH PROBLEMS IN ADULTS (4). Prerequisites, NURS 642, NURS 715, NURS 720, NURS 726, NURS 810, NURS 811 or permission of the instructor. This capstone course focuses on the management of complex health problems in adult populations for the adult nurse practitioner.

NURS 819 [259] PRACTICUM IN PRIMARY CARE MANAGEMENT OF ADULTS (1–2). Prerequisite, completion of NURS 715, NURS 720, NURS 726, NURS 810. A precepted practicum in community-based ambulatory care settings that provides experiences in continuity of care in the delivery of personal health services to adult individuals and their families.

NURS 825 [212] SEXUAL AND REPRODUCTIVE HEALTH (3). Prerequisites, NURS 715, NURS 720, NURS 726, NURS 810 or permission of the instructor. Uses a life span approach to examine principles of primary care management of childbearing couples and sexual reproductive health in women and men. Application is in community-based settings.

NURS 826 [292] INTRODUCTION TO POPULATION HEALTH AND COMMUNITY-BASED PRACTICE (2). Introduces fundamental concepts and models of community-oriented nursing practice and the central issues affecting that practice. Focuses on underserved and rural communities.

NURS 827 [211] CHILD HEALTH ISSUES IN PRIMARY CARE (3). Prerequisites, NURS 715, NURS 720, NURS 726, NURS 810; prerequisite or corequisite, NURS 642 or permission of the instructor. Examines the principles of assessment, management, evaluation and continuing care of children in primary care settings. Developmentally appropriate, family-centered approaches and management of common medical problems are addressed.

NURS 828 [269] ADVANCED CLINICAL PRACTICUM IN COMMUNITY ORIENTED PRIMARY CARE (2). Prerequisites, NURS 715, NURS 720, NURS 726, NURS 810, NURS 825, NURS 827. Introduction to supervised clinical practice in primary health care with emphasis on use of history, physical examination and laboratory data to plan interventions for promoting and restoring health.

NURS 830 [293] COMMUNITY-ORIENTED PRIMARY CARE FOR UNDERSERVED POPULATIONS (3). Introduces principles of community-oriented primary care with rural underserved populations: health assessment, program planning and evaluation; culturally competent care; and effective and efficient practice management strategies.

NURS 833 [253] SPECIALTY CARE IN THE HEALTH OF WOMEN (4). Prerequisites, NURS 715, NURS 720, NURS 726, NURS 810, NURS 825 or permission of the instructor. Focuses on the primary care of women with complex gynecological problems, reproductive complications and socially derived health care problems. Emphasis is placed on assessment, diagnosis, management and clinical decision making.

NURS 838 [254] HEALTH CARE IN WOMEN PRACTICUM (1-3). Prerequisites, NURS 715, NURS 726, NURS 810, NURS 825, NURS 833. This course gives the student a concentrated, experiential opportunity to provide advanced practice nursing in selected areas of women's health.

NURS 840 [242] ADVANCED CONCEPTS IN AMBULATORY PEDIATRIC NURSING (4). Prerequisites, NURS 710, NURS 720; prerequisite or corequisite, NURS 725. Focuses on ambulatory nursing management of children. Content includes health promotion, health maintenance and common clinical symptomatology/problems in infants, children and adolescents.

NURS 841 [241] FAMILY RESPONSES TO INFANT, CHILD, AND ADOLESCENT HEALTH PROBLEMS (2–3). Prerequisites, NURS 710, NURS 720, NURS 725, NURS 840, or permission of the instructor. Focuses on family responses to neonatal and pediatric health problems. Students function in an advanced practice nursing role, working with families of neonatal and pediatric clients with acute and chronic health problems.

NURS 842 [240] NURSING INTERVENTIONS WITH PSYCHOPHYSIOLOGICAL PROBLEMS OF INFANTS AND CHILDREN (2–3). Prerequisites, NURS 710, NURS 720, NURS 725, NURS 840 or permission of the instructor. Prepares the advanced practice neonatal or pediatric nurse to design and implement a coordinated system of interventions that promote optimal health and development status for infants and children with psychophysiological health problems.

NURS 849 [244] CLINICAL PRACTICUM IN ADVANCED PEDIATRIC NURSING (1–5). Prerequisites, NURS 710, NURS 725, permission of the instructor. Supervised practicum in an advanced practice role in a selected health care setting that provides primary care and/or specialized health care to infants, children or adolescents.

NURS 853 [258] MANAGEMENT OF THE CRITICALLY ILL INFANT (4). Prerequisites, NURS 710, NURS 720; prerequisite or corequisite, NURS 725. Prepares the advanced neonatal nurse to manage the high-risk neonate during the critical and convalescent phases of illness, including after hospital discharge.

NURS 859 [262] EXTERNSHIP IN THE ADVANCED NURSING MANAGEMENT OF THE HIGH-RISK NEONATE (1–5). Prerequisites, NURS 720, NURS 725, NURS 853 (or concurrent). The advanced neonatal nurse manages the health needs of a caseload of high-risk infants and their families under the supervision of an experienced nurse practitioner or physician.

NURS 860 [246] PSYCHIATRIC NURSING INTERVENTIONS WITH INDIVIDUALS (3). Prerequisite, NURS 727 or permission of the instructor. Focuses on theories, techniques and research related to providing individual psychotherapy. Contextual factors affecting the delivery of psychiatric-mental health nursing services are analyzed.

NURS 863 [248] PSYCHIATRIC-MENTAL HEALTH NURSING FOR UNDERSERVED POPULATIONS (3). Prerequisites, NURS 727, NURS 860, NURS 861 or permission of the instructor. Utilizing epidemiology, psychoeducation, case management and health policy, students examine the scope of mental health problems and services for underserved populations.

NURS 864 PSYCHIATRIC-MENTAL NURSING INTERVENTIONS: FAMILIES AND GROUPS (3). Prerequisties, NURS 727, NURS 860 or permission of the faculty. Students will analyze theories, techniques and research relevant to therapy with groups and families experiencing mental health problems.

NURS 869 [278] PRACTICUM IN PSYCHIATRIC MENTAL HEALTH CARE FOR ADVANCED PRACTICE NURSES (1–3). Prerequisites, NURS 727, NURS 860 or permission of the faculty. Students apply knowledge and skill in selected domains of the advanced practice of psychiatric-mental health nursing. Supervision, peer evaluation and independent readings will enhance the experience.

NURS 870 [117] HEALTH CARE INFORMATICS (3). Focuses on developing an understanding of the concepts relevant to health care informatics and the use of computerized information systems, as well as the use of computer applications to support clinical and administrative decision making.

NURS 871 [236] LEADERSHIP IN ORGANIZATIONS (3). Examines health care and nursing practice organizations, the influence of the external and internal environment on these organizations and the role and relationship of nurse leaders to the nursing practice environment and to the greater organization.

NURS 872 [237] HUMAN RESOURCES MANAGEMENT (3). Explores the knowledge and skills required for effective human resource management. Managerial behaviors that promote and maintain a professional nursing practice environment are emphasized.

NURS 873 [238] FINANCIAL MANAGEMENT (3). Examines the issues of health care economics, financial management and budgeting that relate to managerial decision making.

NURS 874 [239] OUTCOMES MANAGEMENT (3). Explores theories and methods related to outcomes management for quality improvement in health care, including improvement science, patient safety approaches, health services, research, evidence-based practice and translation research.

NURS 875 [290] PRINCIPLES OF TEACHING APPLIED TO NURSING (3). Provides students who have had no previous teaching experience with educational principles necessary to teach nursing. Opportunities for observation and analysis of undergraduate instruction are provided.

NURS 876 [291] INNOVATIONS IN NURSING AND HEALTH CARE CURRICULA (3). This course is designed to examine the curricular foundations and expectations of contemporary nursing and health care education in academic or clinical settings.

NURS 878 [243] HEALTH CARE RESIDENCY AND INTEGRATIVE SEMINAR (3). Prerequisites and corequisites: all required courses for the HCS specialty or concurrent enrollment in final HCS course work. Students develop, implement and evaluate managerial strategies related to the management of human and material resources, fiscal services, information systems, policy, quality outcomes and/or physical facilities in an integrative fashion.

NURS 992 [392] MASTER'S PAPER (3).

NURS 993 [393] THESIS (3–6).

Supporting Graduate Electives

NURS 685 [185] CARE OF THE DYING AND BEREAVED THROUGHOUT THE LIFE SPAN (3). Students from a variety of health sciences-related disciplines gain an understanding of issues in working with dying and bereaved individuals of all ages and their families.

NURS 687 [187] ETHICAL ISSUES IN NURSING PRACTICE (2). Examination and discussion of major ethical issues arising in the professional practice of nursing in the context of systematic consideration of the nature of ethical choice.

NURS 703I [603] ALTERNATIVE MEDICINE (3).

NURS 704 [204] SCIENTIFIC WRITING (1). Focuses on the principles and practice of scientific writing, with emphasis on research proposals, theses, research reports, dissertations and articles for publication. Spring.

NURS 780I [608] MULTIDISCIPLINARY PERSPECTIVES ON MANAGING DIABETES MELLITUS (2). This course examines the current issues involved in managing diabetes mellitus in persons over their life span. Contributions of the multidisciplinary team are an important theme throughout this course.

NURS 781 GENOMICS AND SOCIETY (3). This multidisciplinary course offers the student opportunity to gain a basic understanding of human genetics and explores the ethical, legal, and social implications of recent advanced in genetics.

NURS 782I [604] AGING AND HEALTH (DENT 604, DPET 604I, EPID 620I, HMSC 904I, MEDI 604, PHYT 904I, PSYC 904I, SOCI 824, SOWO 604I) (3).

NURS 783I [607] AGING AND PUBLIC POLICY (DENT 607, DPET 607I, FMME 607, HMSC 951I, HPAA 961, MEDI 607, PSYC 907, SOWO 607I) (3).

NURS 799 [113] SPECIAL PROBLEMS (Var.).

Doctor of Philosophy in Nursing

The discipline of nursing is concerned with the study of human experiences related to health, illness and life transitions, as well as the professional practices that enhance well being, promote a healthful life, prevent injury and disease, facilitate recovery from and stimulate adaptive responses to illness and disability, ameliorate the negative effects of the treatment of disease and promote a dignified and peaceful death. The Ph.D. in nursing program at the University of North Carolina at Chapel Hill School of Nursing is designed to prepare scholars who will contribute to the science of nursing by expanding—generating, evaluating and disseminating—knowledge in these areas for use by nurses and others concerned with health care.

With changes in demography, advances in technology and changes in the social and economic mandate for health care, the faculty of the School of Nursing has chosen to emphasize scholarship in five areas: preventing and managing chronic illness and major health threats, reducing health disparities, improving health care quality and patient outcomes, understanding the biobehavioral and genetic bases of health and illness and developing innovative approaches for translating scientific findings to practice. In the area of preventing or managing chronic illness, emphasis is on a range of chronic conditions including people at all stages of life. There are studies addressing diabetes, cancer, cancer survivorship, Alzheimer's disease, arthritis cardiovascular disease, obesity, depressive symptoms, HIV/AIDS and urinary incontinence among other conditions across the life span. The focus on reducing health disparities seeks to understand and eliminate these disparities in populations that bear the greatest burden of illness and those living in rural areas. There are studies on factors that contribute to illness burden among African Americans and Latinos and are testing interventions to improve the health of these groups. With our expanded biobehavioral laboratory, students can focus on the interactions among biological, behavioral and social factors in preventing or managing illness. The areas of emphasis include the mechanisms that underlie a variety of inflammatory disorders, the epigenetics of breast cancer and the relationship between stress and physiological responses in various conditions. Another priority area of study is the improvement of health care quality and patient outcomes, which includes areas such as the relationship between nursing care, patient and system level outcomes, factors influencing the nursing shortage and improving the nursing work environment. With the increasing research in nursing areas as noted here, there is a need to translate the findings to improve practice. As the fifth area of emphasis in the program, there is ongoing work between clinical and community partners to ensure that the results of studies meet the needs of practitioners as well as methods for synthesizing findings from both qualitative and quantitative studies to inform both research and practice.

The Ph.D. program in nursing emphasizes study of 1) the understanding of health conditions in varying biographical, cultural, historical, clinical, ethical/legal and organizational contexts, 2) practices to appraise health, improve health and prevent health problems and 3)

ways to evaluate the application of these practices in real-world settings across the continuum of care. Faculty help students link their clinical and research interests with the program emphasis. For example, students may focus their program of study on various kinds of chronic conditions, health-related social problems or advanced biobehavioral measurement techniques. They may focus on studying and testing theories and concepts from nursing and other disciplines that address chronic conditions or the system of care. They may focus on population groups varying by gender, developmental level, race/ethnicity or genetic predisposition. They may focus their study on specific theory-driven individual, family or community-oriented interventions in the biobehavioral, psychosocial, psychoeducational and/or technological domains. Or, they may focus on studies that seek to understand how to improve access to care, to investigate the effectiveness, costs, quality and outcomes of organizational systems that provide services across the continuum of care.

The program emphasizes the value and capable use of a variety of methodological and analytic approaches from the biological, behavioral and social sciences and the humanities, and interdisciplinary and participative collaboration with other scholars and affected populations. The overall goal of the program is to prepare competent, culturally sensitive and compassionate scholars of nursing who will, through their active engagement with and passion for scholarship, contribute to the goal of a healthy nation.

Doctoral Curriculum

Doctoral students can expect to take two or three years of course work, in addition to completing a dissertation. The curriculum includes four components: a required core curriculum, an area of concentration, comprehensive exams and a dissertation, a minor or secondary area of study and elective (optional) courses. Recommended curriculum components are listed below.

The doctoral curriculum is designed to increase the understanding of chronic illness prevention and management and the health care system. Methodological course work includes quantitative and qualitative research methods, statistics, measurement, health policy and theory development. Students also take additional nursing courses and three courses outside of nursing that support the development of a specific focus on a particular age or gender group, population level (e.g., families, individuals or communities), a particular response or intervention strategy, a particular disease entity or nursing systems. Because of the rich resources available on the UNC–Chapel Hill campus, courses are available in fields such as psychology, sociology, anthropology, epidemiology, health policy and administration and physiology.

Required Core

NURS 921 [335] THEORIES OF PREVENTION OF CHRONIC CONDITIONS (3). Overview of theory and research related to the prevention of chronic conditions across the life span. Concepts such as health, illness, chronicity, risk, vulnerability, resilience and disability are examined. (On request.) Staff.

OR

NURS 922 [336] THEORIES OF MANAGEMENT OF CHRONIC CONDITIONS (3). Examines theories and concepts related to the management of chronic illness including their historical evolutions, social-political influences, implicit assumptions and biases. (On request.)

OR

NURS 928 [279] ORGANIZATIONAL THEORIES APPLIED TO NURSING (3). Examines contemporary issues and programs in nursing systems. Students use a four-level nursing systems model to analyze programs of research related to systems.

NURS 910 [281] KNOWLEDGE DEVELOPMENT IN NURSING (3). Examines the origin and development of nursing knowledge, theories and of research testing various nursing theories and models.

NURS 915 [352] NURSING, HEALTH ORGANIZATIONS AND POLICY MAKING (3). Interrelated responses of nursing, the organization of health care and policy over nurse leaders to public policies in policy making, with consequences for organizations' administration, services, staffing, interorganizational linkages and health of the public.

NURS 970 [370] ADVANCED STATISTICS I: PRINCIPLES OF REGRESSION AND CORRELATION (3). Principles of bivariate and multivariate regression and correlations are studied. Emphasis is on the application of these techniques in the analysis of nursing and health-related data.

NURS 971 [371] ADVANCED STATISTICS II: PRINCIPLES OF ANALYSIS OF VARIANCE (3). Principles of variance and covariance—univariance ANOVA, multiple ANOVA, ANCOVA, repeated measures ANOVA—are studied. Emphasis is on application of these techniques in the analysis of nursing and health-related data.

NURS 976 [376] ISSUES IN SAMPLING AND DESIGN FOR NURSING RESEARCH (3). Discussion of critical analyses of methodologies and design. Quantitative measures, qualitative methods, design and sampling are examined for the study of nursing phenomena.

NURS 977 [377] QUALITATIVE METHODS (3). Examines the philosophical orientation and methods of qualitative techniques including grounded theory and phenomenology, consideration of research designs, ethical issues, issues of rigor, data collection and analysis.

NURS 978 [378] PRINCIPLES OF MEASUREMENT (3). Examination of measurement and techniques for assessing validity, reliability and structure of data collection instruments. Instrumental construction and procedures for critical evaluation of instruments are included.

Six additional credits in the substance of nursing are required from those listed below.

NURS 899 [300] SPECIAL TOPICS IN NURSING (Var.). Topics directed by an authority in the field.

NURS 921 [335] THEORIES OF PREVENTION OF CHRONIC CONDITIONS (3). See above.

NURS 922 [336] THEORIES OF MANAGEMENT OF CHRONIC CONDITIONS (3). See above.

NURSE 928 [279] ORGANIZATIONAL THEORIES APPLIED TO NURSING (3). See above.

NURS 930 [310] INFANTS AND CHILDREN AT RISK (3). Applies the developmental science perspective to children at risk for health problems. Students examine conceptual models, design, measurement and ethical issues involved in preventing or ameliorating these health problems.

NURS 932 [339] FAMILIES AND HEALTH (3). Theoretical, methodological and ethical issues related to family research, including health promotion, risk reduction, vulnerability and health risk, in the context of acute and chronic illness across the life span. Staff.

NURS 933 [351] HEALTH CARE QUALITY AND PATIENT OUTCOMES: CONCEPTUAL AND EMPIRICAL APPROACHES (3). Examines literature on quality of care: effectiveness, safety, efficiency, equity, timeliness and patient-centeredness. Critically evaluates conceptual frameworks, research designs, sources of data, analytic approaches and implications for health care policy

NURS 957 [338] FROM THEORY TO INTERVENTION IN CHRONIC CONDITIONS (3). In-depth exploration of selected programmatic research in

nursing and related fields on prevention and management of chronic conditions in order to generate and evaluate treatment theory and intervention protocol. Staff.

NURS 960 [384] PROSEMINAR IN NURSING (1–3). Proseminars are offered for one, two or three credits. Topics differ each semester.

NURS 994 [394] DISSERTATION REGISTRATION (at least 6).

AREA OF CONCENTRATION
Nine credits in an area of concentration that supports the student's program are required. An area of concentration can be a cluster of courses from one or more departments.

Elective (Optional) Courses

Six credits required in courses selected as elective.

NURS 950 [315] ANALYSIS OF THE ACADEMIC ROLE IN NURSING EDUCATION (3). Knowledge, theories and skills necessary for transition into an academic teaching role in university schools of nursing. Particular emphasis on the teaching-learning process as used in higher education. Spring. Staff.

NURS 953 [353] ETHICS AND LAW IN HEALTH CARE AND RESEARCH (3). Addresses ethical/legal dilemmas in health care and research and how health professionals resolve dilemmas. Students analyze nurses' ethical/legal responsibilities, decision making, and synthesize literature from ethics, law, and policy.

NURS 958 [337] DESIGNING INTERVENTION STUDIES (3). Examination of methodological, ethical and practical issues in the design and implementation of theory-based intervention studies. (Alternate years.) Staff.

NURS 961 INTEGRATIVE LITERATURE REVIEW (3). Designed to develop students' skills in writing integrative literature reviews, students read method literature, issue literature and examples of published integrative reviews.

NURS 979 [379] QUALITATIVE ANALYSIS (3). Emphasizes the work of analysis and interpretation. Students apply relevant qualitative techniques to their own data.

NURS 980 [380] OBSERVATIONAL METHODS (3). Explores quantitative observational research techniques. Strategies for developing coding systems, determining reliability and validity and analyzing data are included.

NURS 981 [381] LONGITUDINAL METHODS AND ANALYSIS (3). Examines longitudinal research methods, including conceptualization, design and analysis. Assumptions and limitations of longitudinal statistics, relationship between design and analyses, and strategies to maintain scientific integrity are covered.

NURS 985 [385] RESEARCH SEMINAR AND PRACTICUM: GUIDED INDIVIDUAL RESEARCH EXPERIENCE (3–5). Directs students to develop research skills related to the dissertation and to their future research.

Division of Occupational Science

www.med.unc.edu/ahs/ocsci
VIRGINIA A. DICKIE, *Director*

Professor

Ruth Humphry (4) Parents and Infants during Co-Occupation/Feeding, Family-Centered Services and Young Children with Developmental Disabilities

Associate Professors

Grace Baranek (10) Autism and Related Developmental Disorders, Sensory Processing and Sensorimotor Performance Related to Childhood Occupations
Malcolm Cutchin (5) Aging, Place, Pragmatism
Virginia A. Dickie (2) Quilting as an Occupation: NC Quilters, Creative Occupations, Community-Based Practice

Clinical Associate Professors

Susan Coppola (9) Geriatric Functional Assessment, Physical Rehabilitation, Fieldwork Effectiveness in Clinic

Clinical Assistant Professors

Catherine Alguire, Services for Children and Adolescents with Developmental Delays, Impact of the Environment to Support Occupations
Lauren Holahan, School-Based Occupational Therapy
Linn Wakeford, Occupation-Centered Services for Infants and Preschoolers with Developmental Delay
Jenny Womack, Aging, Community-Based Practice, Assistive Technology, Universal Design and Environmental Accommodations

Professors Emeritae

Marlys M. Mitchell
Cathy Nielson

Associate Professor Emerita

Jane Rourk

The Division of Occupational Science in the Department of Allied Health Sciences offers two graduate programs: a master of science (M.S.) degree with a major in occupational therapy (OT), and a doctor of philosophy (Ph.D.) degree in occupational science. The M.S. in occupational therapy program is a two-year program designed for individuals with a baccalaureate degree in a field other than occupational therapy. It is an entry level program for individual who wish to become occupational therapists. The Ph.D. program in Occupational Science accepts applicants with an earned master's degree in occupational therapy or a related field (see admission requirements below). The doctoral program prepares individuals who wish to pursue academic careers that could include teaching, research and other scholarly activities related to occupational science.

Requirements for Admission into the M.S. Program in Occupational Therapy

1. Bachelor's degree from an accredited institution.
2. Submission of Graduate Record Examination (GRE) scores from the Educational Testing Service.
3. Academic record that demonstrates potential to do work at the graduate level.
4. Completion of the OT supplemental application.

The M.S. program has the following prerequisites:

There are eight total prerequisite courses, four of which are fixed (core body of knowledge) and four of which come from a flexible and diverse menu of categories. All prerequisites must be taken for credit in an academic institution.

Fixed Prerequisites

1. Human anatomy with a lab or applied computer experiences*
2. Human physiology*
3. Abnormal psychology
4. Introductory statistics

* a two-semester sequence of combined anatomy and physiology; parts I and II may be substituted for separate courses.

Flexible Prerequisites

1. Human/individual behavior (For example: developmental psychology, child development, adulthood and aging, cognitive psychology, neuropsychology)

2. Modes of reasoning (For example: philosophy and ethics, statistics or data analysis [beyond the introductory course], religion, literature taught in a foreign language, research design or method of inquiry in a social science)
3. Study of social relationships, institutions and systems (For example: linguistics, cultural/social anthropology, sociology, public health, public policy, leisure studies, social work, political science, minority studies)
4. Occupation: Complete a course in either an academic or community-based setting that requires the skills of your body as well as your mind. Learn an activity that is new to you and personally challenging. The course should be taught in class format so learning an activity includes other people. The class must be of substantial length (minimum of six weeks, meeting once a week) and depth. You must complete this class prior to writing the reflective statement for your application. (Examples: creative writing, poetry writing, studio art class, woodworking, jewelry making, theatre, dance, music, sports.)

The master of science program requires a minimum of 63 semester credit hours. The program is 24 months in length and includes substantial fieldwork experience.

Occupational therapy courses are available only to graduate students enrolled in the M.S. program at the University.

Courses for Graduates in the M.S. in Occupational Therapy Program

704 [304] RESEARCH IN OCCUPATIONAL SCIENCE AND THERAPY (3). Examination of research approaches and issues within occupational science and occupational therapy. Development of skills in writing research proposals and applying research results to insure evidence-based practice. Fall. Cutchin.

718 [211] MUSCULOSKELETAL DIMENSIONS OF OCCUPATIONAL PERFORMANCE (4). An in-depth review of musculoskeletal anatomy and kinesiology. Application is stressed as related to anatomical, physiological, and biomechanical dimensions of movement and occupational performance. Fall. Womack.

720 [220] NEUROSCIENCE: PROCESSES SUPPORTING OCCUPATION (3). Neurophysiological processes contributing to functional abilities. Study of CNS related to observed behaviors, affect and higher cognitive components of function. Spring. Womack.

720A [320A], 720B [320B] FIELDWORK II (6 each). Direct experience with clients/patients in varied service treatment settings. Experience will include adult disabilities (A) and a second experience in an area of special focus (B). Summer. Coppola.

722 [222] BIOMEDICAL AND PHENOMENOLOGICAL PERSPECTIVES ON ILLNESS AND DISABILITY (4). The biomedical and phenomenological aspects are presented and contrasted, using medical literature and personal narratives. Emphasis on humanistic values, biomedical information and investigative reasoning for effective occupation-centered practice. Spring. Staff.

736 [207] OCCUPATIONAL THERAPY PRACTICE ENVIRONMENTS (2). Overview of OT practice settings, professional organizations and regulatory bodies. Factors influencing practice, including legislation, reimbursement, documentation and culture of communities. Ethics, confidentiality, self-awareness, teamwork and professionalism in practical settings. Fall. Staff.

738 [338] POLITICAL, ADMINISTRATIVE AND FINANCIAL CONTEXTS OF SERVICE DELIVERY (3). Exploration of public policies and regulations, administrative systems and skills, reimbursement, and financial aspects of traditional service delivery system. Fall. Nielson.

740 [344] EVOLUTION OF COMMUNITY-BASED PRACTICE: DEVELOPMENT, IMPLEMENTATION AND EVALUATION (2). History and development of occupation-based services in community settings; evolution, structure, and operation of community programs; use of consulting and planning skills in a comprehensive and systematic planning model. Spring. Nielson.

748 [248] FUNDAMENTALS OF OCCUPATION-CENTERED PRACTICE (4). In-depth examination of core principles and methods involved in comprehensive occupational analysis, assessment of occupational performance and therapeutic occupation across practice areas. Fall. Wakeford, staff.

750 [250] OCCUPATIONS, ADAPTATION AND TECHNOLOGY I (5). Prerequisites, OCCT 726, 748. Problem-orientation approach to assessment, treatment planning and use of clinical reasoning to develop intervention strategies. Remediative, compensatory and adaptive approaches to physical and psychosocial dysfunction are explored through case studies. Spring. Womack, staff.

751 [251] OLDER ADULTS: OCCUPATIONS, ADAPTATIONS AND TECHNOLOGY II (2–3). Prerequisites, OCCT 826, 748. A problem-based learning approach to the occupational therapy clinical reasoning process; assessments, interventions and adaptations for older adults. Spring. Coppola.

752 [252] CHILDREN: OCCUPATIONS, ADAPTATION, AND TECHNOLOGY III (3). Prerequisites, OCCT 828, 750, 751. A problem-based learning approach to the occupational therapy clinical reasoning process, assessments, interventions and adaptations for children with disabilities. Spring. Wakeford.

826 [226] OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS I (3). Investigation of continuity/discontinuity in pattern, function and meaning of occupations from early adulthood through old age. Analysis of individual differences in occupational performance within family, SES and cultural contexts. Fall. Dickie.

828 [228] OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS II (3). Prerequisite, OCCT 826. Age-related changes in occupational performance from infancy through adolescence. Developmental contextualism used to frame intrinsic changes and environmental influences. Fall. Humphry.

842 [342] HISTORICAL EVOLUTION OF OCCUPATIONAL THERAPY AND SCIENCE (3). This historical analysis of occupational therapy and occupational science centers upon questions of philosophical foundations, knowledge development, division of labor and professionalism within health care. Spring. Dickie.

890 [350] INDEPENDENT STUDY: OCCUPATIONAL THERAPY AND SCIENCE (Var.). Elective. Independent study to pursue specific interests and topics. Faculty supervision. May be repeated for credit. Fall, spring, and summer. Baranek, Cutchin, Humphry, Coppola, Dickie.

992 [330] APPLIED RESEARCH EXPERIENCE (2). Collaborative research projects in occupational science or occupational therapy. Emphasis on data collection, analysis and professional communications of research findings. Spring. Baranek, Cutchin, Dickie, Humphry.

993 [393] MASTER'S THESIS (Var./minimum 4). Permission required. Fall, spring and summer. Staff.

Requirements for Admission into the Ph.D. Program in Occupational Science

The Ph.D. program in occupational science accepts academically qualified applicants who have completed master degrees in occupational therapy, relevant social and behavioral sciences or related health fields. Applicants receive a thorough review for evidence of potential success in a doctoral program in The Graduate School at UNC–Chapel Hill. In order to achieve closely mentored research experiences, only applicants with expressed interests consistent with existing programs of research and scholarly work of the faculty are admitted. Final selection among qualified applicants will be based on his or her interview with core faculty members in the Ph.D. program in occupational science. Review the UNC–Chapel Hill Web site for information about application to The

Graduate School. In addition to the formal application to the Graduate School, the following information is required:

1. Official copies (two copies) of all undergraduate and graduate transcripts
2. Graduate Record Examination (GRE) scores (taken within the last five years)
3. Results of the TOEFL (Test of English as a Foreign Language, if applicable)
4. A reflective essay detailing personal and professional goals relevant to the pursuit of a Ph.D. in occupational science at UNC–Chapel Hill (submit directly to the Division of Occupational Science) and
5. Three letters of recommendation from individuals that support the applicant's potential as an educator and scholar (sent to the division)

The Ph.D. program requires a minimum of 45 semester credit hours beyond the master's degree. This course of study covers four domains: a) occupational science, b) an interdisciplinary cognate area that complements occupational science, c) research design and methodology and d) competencies for an academic career. All graduates must complete a doctoral dissertation in occupational science. Students are also expected to reach satisfactory competence in teaching and research as determined by their career goals.

With approval from the instructor, occupational science courses are open to graduates students interested in 1) the study of people engaged in everyday activities in different situations and 2) how various experiences in an activity or patterns of engagement influence development, health and quality of life across the lifespan.

Courses for Graduates in the Ph.D. Program in Occupational Science

826 OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS I: ADULTHOOD (3). Investigation of continuity/discontinuity in pattern, function and meaning of occupations from early adulthood through old age. Analysis of individual differences in occupational performance within family, SES and cultural contexts. Fall. Dickie.

828 OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS II: CHILDHOOD (3). Study of age-related change process shaping everyday activities from infancy through adolescents within family, SES and cultural contexts. Fall. Humphry.

842 HISTORICAL EVOLUTION OF OCCUPATIONAL THERAPY AND SCIENCE (3). The historical analysis of occupational therapy and occupational science centers upon questions of philosophical foundations, knowledge development, division of labor and professionalism within health care. Spring. Dickie.

850 INDEPENDENT STUDY IN OCCUPATIONAL SCIENCE (1–3). Independent study to pursue specific interests and topics under faculty supervision. Fall and spring. Baranek, Cutchin, Dickie, Humphry.

890 SEMINAR ON SPECIAL TOPICS IN OCCUPATIONAL SCIENCE (3). Discussion and critical evaluation of philosophy, theory and scientific issues associated with the study of people's activities in the context of their everyday lives. Topics differ each semester. Fall and spring. Baranek, Cutchin, Dickie, Humphry.

994 DOCTORAL DISSERTATION IN OCCUPATIONAL SCIENCE (1–3). Doctoral dissertation in occupational science. Fall and spring. Baranek, Cutchin, Dickie, Humphry.

Department of Pathology and Laboratory Medicine

www.pathology.unc.edu

J. CHARLES JENNETTE, *Chair*
Mark E. Brecher, *Vice Chair for Clinical Services*
Thomas W. Bouldin, *Vice Chair for Faculty and Trainee Development*
David G. Kaufman, *Vice Chair for Research Development*

Professors

Nadia Malouf Anderson (26) Muscle Diseases, Plasticity of Adult-Derived Stem Cells
Dwight A. Bellinger (89) Laboratory Animal Medicine, Comparative Pathology
Thomas W. Bouldin (72) Neuropathology, Ocular Pathology, Neurotoxicology
Mark E. Brecher (128) Blood Component Processing and Storage, Transfusion Strategies, Transfusion Transmitted Diseases
John F. Chapman Jr. (79) Laboratory Practice, Clinical Chemistry
Frank C. Church (107) Molecular Pathology, Thrombosis and Hemostasis, Breast and Prostate Carcinogenesis, Macromolecular Structure-Function
William B. Coleman (139) Biology of Liver Stem Cells, Hepatocarcinogenesis, Lung and Breast Carcinogenesis, Epigenetics and Cancer
Marila Cordeiro-Stone (96) DNA Replication, DNA Repair, Cell Cycle Checkpoints in Human Cells, Mechanisms of Mutagenesis and Carcinogenesis
Cherie H. Dunphy (189) Hematopathology
Ronald J. Falk (172) Glomerular Disease, Lupus, Vasculitis, Dialysis
Rosann A. Farber (118) Genetic Instability in Cancer, Human Molecular Genetics, Microsatellite Instability, Fragile X Mental Retardation
Susan A. Fiscus (173) Retrovirology
Peter H. Gilligan (174) Diagnostic Bacteriology, Pulmonary Disease in Cystic Fibrosis, Toxin Mediated Diarrheal Disease
Margaret L. Gulley (196) Molecular Diagnostics, Oncology, Epstein-Barr Virus
Thomas R. Griggs (50) Blood Coagulation, Atherosclerosis
Catherine A. Hammett-Stabler (171) Clinical Chemistry, Toxicology, Clinical Pharmacology
J. Charles Jennette (61) Renal Pathology, Immunopathology
David G. Kaufman (34) Human Origins of DNA Replication; Interactions between Human Endometrial Epithelial and Stromal Cells
William K. Kaufmann (95) Human DNA Metabolism and Cancer
Joe N. Kornegay (232) Duchenne Muscular Dystrophy; Canine Model, Translational Studies, Muscle Hypertrophy
Susan T. Lord (94) Macromolecular Structure/Function of Fibrinogen, Molecular Genetics, Cardiovascular Disease
Nobuyo Maeda (116) Molecular Genetics of Atherosclerosis, Transgenic Laboratory Animals as Model Systems, Molecular Evolution
Susan J. Maygarden (131) General Surgical Pathology, Cytopathology, Prostate Carcinogenesis
Timothy C. Nichols (156) General Cardiology, Cardiac Catheterization, Per-Cutaneous Transluminal Coronary Angioplasty
Howard M. Reisner (38) Immunogenetics of Blood Coagulation, Immunochemistry
Oliver Smithies (115) Molecular Pathology, Genetically Engineered Animal Models of Human Disease, Targeted Mutagenesis
Darrel W. Stafford (127) Molecular Biology
James A. Swenberg (66) Chemical Carcinogenesis, Toxicology
Richard R. Tidwell (42) Medicinal Chemistry, Antiviral and Antimicrobial Agents, Protease Inhibitors
Michael D. Topal (41) Genomic Instability and Disease
Bernard E. Weissman (119) Tumor Suppressor Genes
Elizabeth M. Wilson (235) Steroid Hormone Regualation of Gene Expression
John T. Woosley (133) Dermatopathology, Hepatobiliary and Gastrointestinal Pathology, Histopathologic Assessment of Prognosis

Associate Professors

Georgette A. Dent (117) Hematopathology, Medical Education
William K. Funkhouser Jr. (152) Surgical Pathology, Molecular Pathology, Immunology
J. Ed Hall (177) Infectious Diseases, Pathogenic Protozoa, Drug Metabolism
Suzanne L. Kirby (181) General Hematology/Oncology and Bone Marrow Transplantation
Chad A. Livasy (193) Surgical Pathology
Christopher P. Mack (188) Transcriptional Regulation in the Cardiovascular System, Smooth Muscle Cell Biology
Volker Nickeleit (190) Renal Pathology, Fibronectins
Charles M. Perou (209) Breast Cancer, Genomics, Microarrays, Tumor Classification; Drug Resistance
W. Eugene Sanders (176) Difibrillation, Pacing Platelets
John L. Schmitz (168) Flow Cytometry, HIV, Diagnostic Immunology, Sexually Transmitted Diseases
Harsharan K. Singh (186) Cytopathology, Fine Needle Aspiration Biopsy
Joan M. Taylor (187) Adhesion Signaling, Cardiovascular Disease
Young E. Whang, (236) Androgen Receptor, Prostate Cancer

Assistant Professors

Jonathon W. Homeister (226) Defining the Molecular Mechanisms of Leukocyte Trafficking and Homing in Inflammatory and/or Immune Reactions
C. Ryan Miller (231) Neuropathology, Cancer Chemotherapy
Melissa B. Miller (211) Molecular Virology
Tara C. Rubinas 229) Gastrointestinal Pathology and Hepatopathology
Nobuyuki Takahashi (184) Animal Models of Hypertension, Preeclampsia, Diabetic Nephropathy and Obesity
Keith E. Volmar (219) Neoplasia and Developmental Abnormalities of the Pancreas
Monte S. Willis (223) Molecular Mechanisms of Cardiac Disease and Ubiquitin-Proteasome Biology
Alisa Sue Wolberg (198) Thrombosis Research, Coagulation

Clinical Professors

Debra A. Budwit (132) Surgical Pathology, Cytopathology, Diagnostic and Prognostic Markers in Gynecologic Neoplasms
John D. Butts (70) Forensic Pathology, Injury Prevention
M. David Goodman (216) Autopsy Pathology
Harold R. Roberts (15) Thrombosis and Hemorrhage Research and Therapy, Hematology

Clinical Associate Professors

Thomas B. Clark III (134) Forensic Pathology, Computer Applications in Forensic Medicine
Kathleen A. Kaiser-Rogers (212) Clinical Cytogenetics
Ruth A. Lininger (166) Surgical Pathology, Breast Pathology
Deborah L. Radisch (213) Forensic Pathology
Scott V. Smith (164) Vascular Biology, Cardiovascular Pathology, Platelet and von Willebrand Factor Pathophysiology
Karen E. Weck (210) Molecular Genetic Pathology
Herbert C. Whinna (167) Mechanisms of Hemostasis and Thrombosis, Biochemistry and Vascular Biology of Blood Coagulation, Protein Structure-Function

Clinical Assistant Professors

Araba N. Afenyi-Annan (220) Transfusion Medicine
Jessica K. Booker (199) Genetics, Breast Cancer
Maryanne Gaffney-Kraft (225) Forensic Pathology
Cynthia D. Gardner (233) Forensic Pathology
Diana Garside (202) Forensic Toxicology
Susan C. Hadler (194) Oral Diagnosis
Leigh B. Thorne (207) Molecular Pathology, Autopsy Pathology
Lisa J. Weinstein (234) Surgical Pathology, Cytopathology
Ruth E. Winecker (165) Forensic Pathology

Clinical Instructors

Kristen M. Boland (214) Anatomic Pathology and Medical Education
Claudia M. Brady (230) Surgical Pathology
Vincent J. Moylan, Jr. (218) Cardiac Pathology and Autopsy Pathology

Research Professors

C. Robert Bagnell Jr. (109) Application of Advanced Light and Electron Microscopy to Research in Basic Medical Sciences
John F. Bradfield (221) Laboratory Animal Medicine and Pathology
Virginia L. Godfrey (148) Veterinary Pathology, Animal Models of Genetic Disease, Autoimmunity

Research Associate Professors

Thomas H. Fischer (169) Gene Therapy, Blood Coagulation, Atherosclerosis
Tracey M. Heenan (163) Laboratory-, Exotic- and Companion-Animal Medicine
Hyung-Suk Kim (137) Gene Targeting and Animal Models for Human Diseases, Hypertension and Hereditary Cerebral Hemorrhage with Amyloidosis and Molecular Evolution
Judith N. Nielsen (222) Animal Health Maintenance, Diagnosis and Eradication
Gloria A. Preston (237) Pathogenesis of Renal Diseases

Research Assistant Professors

Jayne C. Boyer (200) Human Molecular Genetics, Molecular Mechanisms of Microsatellite Instability
Oleg V. Gorkun (195) Coagulation, Fibrinolysis, Fibrinogen Structure
Seigo Hatada (217) Appling Gene Targeting for Curing Genetic Diseases
Masao Kakoki (224) Prevention of Cardiovascular Diseases
Dennis A. Simpson (204) Cell Biology, Molecular Biology, Virology
Julia W. Whitaker (227) Laboratory Animal Medicine
Hong Xiao (215) Immune-Mediated Glomerular Disease and Vasculitis
Xianwen Yi (228) Alpha Lipoic Acid and Diabetes Mellitus
Maimoona A. Zariwala (205) Genetic Analysis of Patients with Primary Ciliary Dyskinesia (PCD)

Adjunct Professors

Byron Butterworth (67) Genetic Toxicology
Robert R. Maronpot (140) Mechanisms of Carcinogenesis
Gary J. Smith (85) Prostate Cancer, Cancer Cell-Tissue Microenvironmental Interaction, Angiogenesis

Adjunct Associate Professors

Gary A. Boorman (102) Toxicological Pathology, Myelotoxicology
Jeffrey I. Everitt (180) Experimental Pulmonary and Toxicology Pathology
Richard S. Paules (144) Oncogenes Tumor Suppressor Genes and Cell Cycle Control in Neoplastic Transformation of Mammalian Cells
Douglas C. Wolf (185) Mechanisms of Toxicity and Carcinogenesis

Adjunct Assistant Professor

Christopher W. Gregory (201) Prostate Cancer, Androgen Receptor

Professors Emeriti

Walter Benson
Stuart Bentley
Myra L. Collins
Robert E. Cross
Frederic G. Dalldorf
Cora-Jean S. Edgell
James D. Folds
Donald T. Forman
Joe W. Grisham
John E. Hammond
William D. Huffines
William W. McLendon
James R. Pick
Katherine B. Pryzwansky
Marjorie S. Read
Kinuko I. Suzuki

Graduate work in the Department of Pathology is offered to those interested in acquiring more extensive knowledge of diseases and their effects at different levels of molecular and cellular organization. Major emphasis is given to investigation of molecular mechanisms responsible for disease processes. Students are given the opportunity to undertake candidacy for the doctor of philosophy degree. Participation in research activities leading to an original dissertation is required of all advanced degree candidates.

Prospective candidates must hold a bachelor's degree from an accredited college or university.

The department is located in the Brinkhous-Bullitt Building, and offers well-equipped laboratories for research and advanced work in pathology.

Courses for Graduates and Advanced Undergraduates

128 [008] BIOLOGY OF HUMAN DISEASE (BIOL 128) (3). Open to all undergraduates and graduates. No prerequisites. Presents an overview of basic human molecular and cellular biology in the setting of common human diseases. The course emphasizes how an understanding of disease mechanisms provides the knowledge base for an informed use of modern health care. Fall. Reisner, Smith.

426 [134] BIOLOGY OF BLOOD DISEASES (BIOL 426) (3). Prerequisite, BIOL 205 or permission of the instructor. An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases: anemias; leukemias; hemorrhagic, thrombotic and vascular disorders; and HIV disease/AIDS. Fall. Church.

462 [162] EXPERIMENTAL PATHOLOGY (1-21). Hours, credits, and instructor to be arranged on an individual basis. This course involves hands-on research experience in a predetermined instructor's laboratory. Students have the opportunity to learn and apply specific techniques and to participate in investigations of molecular mechanisms responsible for disease processes (pathobiology). Contact the director of graduate studies in pathology for more information. May be repeated. Staff.

463 [163] ELECTRON MICROSCOPY (3). Permission of the instructor. Theoretical and practical aspects of electron microscopy. Application of transmission and scanning electron microscopy to pathology, with emphasis on ultrastructure of cells and organelles. Two lecture and six laboratory hours a week. Fall. (2007 and alternate years.) Bagnell.

464 [164] LIGHT MICROSCOPY (3). Permission of the instructor. Course focuses on practical fundamentals of light microscopy including optics, contrast mechanisms, fluorescence, laser scanning confocal microscopy, photography and digital imaging. Spring. Bagnell.

678 [178] HUMAN DNA METABOLISM (2). Prerequisite, a basic biochemistry course. This course examines the molecular biology of DNA replication, resorption, recombination and repair as these processes occur in human cells. Two seminar hours per week. Fall. (2006 and alternate years.) Kaufmann.

Courses for Graduates

713 [213] MECHANISMS OF DISEASE (2, 3 or 5). Prerequisite, cell biology, histology or permission of the course director. A graduate course on cell injury and pathogenesis of disease with emphasis on basic mechanisms at the molecular, cellular and organismal levels. Three lecture hours (three credits) and a two-and-a-half-hour laboratory (two credits) each week. Fall. Church.

723 [223] TRANSLATIONAL MEDICINE (2). Prerequisite, permission of the instructor. Conducted on a tutorial basis, with the aim of providing experience with specialized techniques including histochemistry, electron microscopy, fluorescent and phase microscopy, chromatography, electrophoresis and ultracentrifugation. Two seminar hours per week, including clinical experiences. Spring. (2006 and alternate years.) Whinna.

725 [225] CANCER PATHOBIOLOGY (3). Permission of the course director required. This course examines pathobiological features of cancer. An interdisciplinary approach draws from epidemiology, genetics, molecular biology and clinical medicine to investigate cancer etiology, pathogenesis, prevention and treatment. Three lecture hours a week. Spring. Kaufmann.

750 [250] APPLIED BIOSTATISTICS (PHCO 750, TOXC 750) (2). Data analysis for biomedical scientists. This largely self-study course deals with basic statistical and quantitative methods for the analysis and interpretation of biomedical data. This course is required for PHCO/TOXC/PATH graduate students. Permission of the instructor is required for other students. Fall. Graves.

792 [292] SEMINAR IN CARCINOGENESIS (TOXC 792) (2). Prerequisite, permission of the instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Students discuss experimental methods and observations as well as theories and generalizations. Two seminar hours a week. Spring. Coleman.

801 [301] SEMINAR IN PATHOLOGY (2). This course emphasizes the development of written and oral scientific communication skills. It is designed specifically for first and second year graduate students within the department. Fall. Cordeiro-Stone.

900 [302] RESEARCH IN PATHOLOGY (2–12). Prerequisite, permission of the department. This is a research course in which advanced students in pathology carry on investigations on mechanisms of disease. Six or more laboratory hours a week, to be arranged. May be repeated. Fall, spring and summer. Staff.

993 [393] MASTER'S THESIS (Var.). Fall, spring and summer. May be repeated. (Total maximum of six credits.) Staff.

994 [394] DOCTORAL DISSERTATION (Var.). May be repeated. Fall, spring and summer. Staff.

Department of Pharmacology

www.med.unc.edu/pharm
GARY L. JOHNSON, *Chair*

Professors

*George R. Breese (15) Drugs and Neural Plasticity, Molecular Neurobiology
*Frank C. Church (107) Proteases and Their Inhibitors Involved in Regulating Thrombosis and Tumor Cell Invasion
Fulton T. Crews (88) Excitotoxicity, Gene Delivery, Neuroprogenetor Stem Cells and Addiction
Channing Der (74) Ras Protein Superfamily, Signal Transduction and Oncogenesis
Kenneth H. Dudley (28) Drug Biotransformation, Penicillin Hypersensitivity
*Linda Dykstra (55) Opioid Analgesics, Drugs of Abuse
*H. Shelton Earp (63) Growth Regulation, Growth Factor and Protein Kinases
Barry Goz (29) Virus and Cancer Chemotherapy
K. Hahn (126) Development of Fluorophores for Site-Specific Protein Labeling, Live Cell Biosensors and their Biological Applications, Motility, Apoptosis and Crosstalk in Signaling
T. Kendall Harden (37) Receptor Biochemistry, Regulation of Second-Messenger Signaling
Gary L. Johnson (124) Receptors/G-Proteins, Defining the Signal Relay Systems Initiated by Various Cellular Stimuli (Including Cytokines), Growth Factors, Antigens, and Drugs Used to Treat Human Disease
Rudolph L. Juliano (62) Membrane Biochemistry of Cell Interactions, Drug Delivery Systems
*J. Stephen Kizer (34) Molecular and Cellular Biology of Post-Translational Processing
Ryszard Kole (57) RNA Splicing, RNA-Protein Interactions, Antisense Oligonucleotides
*Richard B. Mailman (52) Neuropharmacology, Structure and Function of Dopamine Receptors, Molecular Drug Design
*William Maixner (64) Pain Research and Autonomic Nervous System Research

Ken D. McCarthy (42) Neuronalglial Interactions Studied in situ Using Electrophysiology, Confocal Imaging and Conditional Knockouts
*Leslie Morrow (105) Molecular Neuropharmacology of GABA Receptors and Alcohol
*Robert A. Mueller (32) Neuronal Stimulation and Oncogene Expression
Robert A. Nicholas (68) G-Protein-Coupled P2Y Receptors, Mechanisms of Antibiotic Resistance
*David A. Ontjes (30) Endocrine Pharmacology, Clinical Endocrinology
*Leslie V. Parise (70) Adhesion Receptors and Signal Transduction in Platelets, Sickle Cell Disease and Cancer
Robert L. Rosenberg (69) Regulation of Ion Channels
Bryan Roth (130) Regulation of Signaling and Trafficking, Drug Discovery
R. Jude Samulski (77) Development of Efficient Viral Vectors for Gene Delivery into Eukaryotic Genes
Gene A. Scarborough (36) Molecular Basis of Plasma Membrane Structure and Function
*Dhiren Thakker (97) Drug Delivery and Metabolism

Associate Professors

*Adrienne D. Cox (90) Ras Family Oncogenes, Lipid Modification and Protein Function
*H. G. Dohlman (127) Receptors and Signal Transduction: Mechanisms of Drug Desensitization
Tim Elston (129) MAPK Activation in the Pheromone Response Pathway of Yeast, Noise in Gene Regulatory Networks, Airway Surface Volume Regulation Diffusion in Viscoelastic Fluids, DlycineMetabolism and the Motion Protein Dynein
Lee M. Graves (89) Growth Factor-Mediated Signal Transduction
*Cam Patterson (115) Vascular Biology, Angiogenesis and Protein Folding and Degradation
David Siderovski (111) Structure and Function of Regulator of G-Protein Signaling (RGS) Proteins
John Sondek (100) X-Ray Crystallography and Transmembrane Signaling

Assistant Professors

Pilar Blancafort (128) Tumorigenesis and Tumor Progression
Franck Polleux (125) Signaling Pathways in the Mammalian Cerebral Cortex
Zefeng Wang (131) Splicing Regulation and Modulation

Research Associate Professors

Jozef Spychala (81) Regulation of Adenosine, Nucleotide and Nucleoside Analogues, Metabolism

Research Assistant Professors

Suresh K. Alahari (109) Integrin Associated Proteins and Antisense Therapeutics
Gavin E. Arteel (118) Alcohol-Induced Liver and Pancreatic Injury, Oxidative Stress
Bonita Blake (121) G-Protein Signaling in the Central Nervous System
James T. McLaughlin (117) Structure and Function of Ion Channels
Zhi Zhong (119) Hepatotoxicology, Renal Toxicology, Organ Transplantation

Adjunct Professors

Emmanuel J. Diliberto Jr. (61) Neuropharmacology
James W. Putney (84) Second Messenger Signaling

Adjunct Associate Professors

Jose Boyer (79) Regulation of Signal Transduction Mechanisms
Kenneth S. Korach (85) Biochemistry and Biology of Steroid Hormone Receptors
Howard A. Rockman (108) Molecular Modeling and Cardiovascular Disease

Adjunct Assistant Professor

John P. O'Bryan (114) Signal Transduction by Tryosine Kinases, Role of Adaptor Proteins, Oncogenesis

Professors Emeriti

Hugh J. Burford
Philip L. Carl (Research Associate Professor)
Curtis Harper
John T. Gatzy
Philip F. Hirsch
Tom S. Miya
Paul L. Munson
William Henry Pearlman
Doris T. Poole
Roy V. Talmage
Svein U. Toverud
* *joint faculty members*

The Department of Pharmacology offers a program of study that leads to the degree of doctor of philosophy in pharmacology. The curriculum is individualized in recognition of the diverse backgrounds and interests of students and the broad scope of the discipline of pharmacology. The basic course requirements for the Ph.D. degree include introductory and advanced courses in pharmacology and related programs in accord with the principal interest of the students in molecular pharmacology, neuropharmacology, or in toxicology. In addition, in order to satisfy the requirements of the department and The Graduate School, the student must pass written and oral doctoral examinations, write a dissertation based on original research, and submit to a final oral examination. Under special circumstances, the department will offer a program leading to the M.S. degree. The requirements are appropriate course work, a written comprehensive examination, a thesis based on original research and a final oral examination.

The department offers a variety of research areas including 1) receptors and signal transduction, 2) ion channels, 3) neuropharmacology, 4) cancer pharmacology, 5) gene therapy and 6) pharmacology of alcohol and drugs of abuse. The student is expected to begin independent research early in his or her training and to participate in an intensive program of research seminars. Close personal contact between preceptor and trainee is encouraged.

Research Facilities

Laboratory facilities and a wide variety of research equipment are available in the department, which is located primarily in the Mary Ellen Jones Building, where it occupies approximately 26,000 square feet (exclusive of classrooms and animal facilities). In addition, several faculty members are located in the Lineberger Comprehensive Cancer Center, the Thurston Bowles Alcohol Center, and the N.C. Neurosciences Hospital.

Assistantships and Other Student Aid

Financial assistance is provided to all students. The stipend is currently $24,000 per year. In addition, tuition, fees and health insurance coverage are provided.

Requirements for Admission

Beginning in 2008–09, all students in the basic science departments in the Medical School and the biological sciences divisions in Biology and Chemistry will enter graduate school through the Biological and Biomedical Sciences Program (BBSP). During the first year students will take courses and complete three rotations in labs from any of the participating departments or curricula.

After identifying a research mentor, if that faculty member is affiliated with the Pharmacology Department, students can choose to join

the Pharmacology Graduate Program. Once in the program, students complete required course work and qualifying examinations, propose a research topic, choose a dissertation committee and engage in dissertation research. The anticipated duration of training is five years.

Our graduate program is dedicated to the training of outstanding scientists in the pharmacological sciences. An outstanding graduate program is a high priority of our department, and the training faculty participate fully at all levels. Our department has the highest level of NIH funding of all pharmacology departments (see News and Events! at www.med.unc.edu/pharm/news) and a great diversity of research areas is available to trainees. These areas include cell surface receptors, G proteins, protein kinases and signal transduction mechanisms, neuropharmacology, nucleic acids, cancer and antimicrobial pharmacology and experimental therapeutics. Cell and molecular approaches are particularly strong, but systems-level research such as behavioral pharmacology and analysis of knock-in and knock-out mice is also well represented. Excellent physical facilities are available for all research areas.

Students completing the training program will have acquired basic knowledge of pharmacology and related fields, in-depth knowledge in their dissertation research area, the ability to evaluate scientific literature, mastery of a variety of laboratory procedures, skill in planning and executing an important research project in pharmacology and the ability to communicate results, analysis and interpretation. These skills provide a sound basis for successful scientific careers in academia, government or industry.

The BBSP will begin accepting applications **July 1, 2008**. The final application deadline is **December 15, 2008**. Please review the BBSP admissions page at www.med.unc.edu/bbsp/apply.html.

To apply to BBSP you must use the Graduate School's online application form which can be accessed at gradschool.unc.edu/admissions/instructions.html#app. Please read the information for Domestic or International applicants at the above Web site before beginning your application. For Question 2 of the application scroll down to School of Medicine and select "Biological and Biomedical Sciences" from the drop down list.

Note: Students interested in the Program in Molecular and Cellular Biophysics must also apply directly to that program. Visit hekto.med.unc.edu:8080 to apply.

Note: Applicants to the NIN-UNC Graduate Partnership in Cell Motility and the Cytoskeleton should also file an application on the NIH GPP Web site (no fee required). Visit gpp.nih.gov/Prospective/InstitutionalPartnerships/CellMotility to apply.

The following are required for an application to be considered complete:

1. Nonrefundable $73 application fee (we cannot review your application until this is paid)
2. Official copies of each of your transcripts. Send one copy to The Graduate School and one copy directly to the BBSP office (see mailing information below)
3. letters of recommendation (submit online)
4. Personal statement (submit online)
5. GRE scores (must be less than five years old; UNC institution code is 5816)
6. TOEFL score (must be less than two years old, and is necessary only if you are an international applicant who does not have an undergraduate degree from a U.S. university)

For Graduate School information and submission of application materials:
UNC Graduate School
Admissions Office
CB# 4010, Bynum Hall
University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27599-4010

For program information and submission of application materials:
BBSP Admissions
3110 Neurosciences Building, CB# 7108
University of North Carolina
Chapel Hill, N.C. 27599-7108
Telephone: (919) 843.6960
Email: bbsp@unc.edu

Courses for Graduates

643 [117] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (BIOC 643, CBIO 643, MCRO 643) (3). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Fall. Cox, Jacobson, Lee, Meissner.

644 [118] CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (BIOC 644, CBIO 644, MCRO 644) (3). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Cox, Jacobson, Lee, Meissner.

701 [201] INTRODUCTION TO MOLECULAR PHARMACOLOGY (2). Permission of the instructor required. A first-year pharmacology course outlining the basic of molecular pharmacology, including molecular biology, drug/receptor interactions, receptors and ion channels, regulation of second messengers and drug metabolism. Two lecture hours a week. Fall. Trejo, Siderovski.

702 [202] PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (TOXC 702) (3). Permission of the instructor required. Introduces students to the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. Three lecture hours a week. Spring. Parise.

705 [323] BEHAVIORAL PHARMACOLOGY (NBIO 705, PSYC 705) (3).

707 [207] ADVANCED TOXICOLOGY (TOXC 707) (3). Prerequisite, PHCO 702 or permission of the course director. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on: inhalation toxicology, developmental toxicology, immunotoxicology, radiation toxicology, renal toxicology and neurotoxicology. Three lecture hours a week. Fall. Swenberg.

710 [210] CELL MEMBRANES (2).

715 [205] THE MOLECULAR PHARMACOLOGY OF CANCER (2). Prerequisites, advanced graduate or advanced undergraduate courses in biochemistry and molecular biology. This course deals with the molecular and cellular basis of anticancer and antiviral chemotherapy, with emphasis on novel approaches including immunotherapy, antisense oligonucleotides and gene therapy. The course includes faculty lectures and student presentations. Fall. Kole.

721 [221] SEMINAR COURSES IN PHARMACOLOGY (1–3). This is a series of seminar courses dealing with advanced topics in modern molecular pharmacology based mainly on discussion of current literature.

722 [222] CELLULAR AND MOLECULAR NEUROBIOLOGY I (PHYI 722) (Var.). Lecture/discussion course on the physiology, pharmacology, biochemistry and molecular biology of the nervous system. Topics include function and structure of ion channels, neurotransmitter biosynthesis and release mechanisms, neurotransmitter receptors and intracellular signaling pathways. Fall. Stuart.

722A [222A] INTRODUCTION TO CELL MOLECULAR NEUROBIOLOGY (BIOC 722A, NBIO 722A, PHYI 722A) (2).

722B [222B] ELECTRICAL SIGNALING (BIOC 722B, NBIO 722B, PHYI 722B) (2).

722C [222C] CELL AND MOLECULAR NEUROBIOLOGY (BIOC 722C, NBIO 722C, PHYI 722C) (2).

723 [223] CELLULAR AND MOLECULAR NEUROBIOLOGY II (PHYI 723) (Var.). Lecture/discussion course on the physiology, pharmacology, biochemistry and molecular biology of the nervous system. Topics include: function and structure of ion channels, neurotransmitter biosynthesis and release mechanisms, neurotransmitter receptors and intracellular signaling pathways. Spring. Stuart.

723A [223A] SYNAPTIC MECHANISMS AND INTRACELLULAR SIGNALING (BIOC 723A, NBIO 723A, PHYI 723A) (2).

723B [223B] PRESYNAPTIC MECHANISMS (BIOC 723B, NBIO 723B, PHYI 723B) (2).

724 [221A] RAS SUPERFAMILY PROTEINS AND SIGNAL TRANSDUCTION (2). Seminar/discussion course covering recent advances in the role of these proteins in signaling and growth. Fall. (Alternate years.) Der, Cox.

725 [221B] SIGNAL TRANSDUCTION (2). Seminar/discussion course on molecular aspects of the receptors, G-proteins, effector proteins, kinases and phosphatases that mediate hormone, neurotransmitter, growth factor and sensory signaling. Spring. (Alternate years.) Harden.

726 [221C] ADHESION RECEPTORS AND SIGNALING IN CANCER AND CV DISEASE (2). Examines the growing number of families of cell adhesion receptors and their role in biological processes including signal transduction, control of gene expression, hemostasis, cancer, neuronal development, immunobiology and embryologic development. Spring. (Alternate years.) Juliano/Parise.

727 [221D] STRUCTURE AND FUNCTION OF ION CHANNELS (2). Seminar/discussion course on the physiology, pharmacology, biochemistry and molecular biology of ion channel proteins. Spring. (Alternate years.) Rosenberg, Oxford.

728 [221E] NEUROPHARMACOLOGY OF ALCOHOL AND SUBSTANCE ABUSE (3). A lecture/discussion course on the biological bases of alcohol and substance abuse. Spring. (Alternate years.) Morrow.

729 [221F] GENE THERAPY: MEDICINE FOR THE 21ST CENTURY (2). A seminar/discussion course on recent advances in targeted gene delivery and gene therapy. Spring. (Alternate years.) Samulski.

730 [330] SEMINAR IN RECENT ADVANCES IN PHARMACOLOGY (1). Students meet as a group with faculty members to develop skills in critical reading and to summarize and discuss selected aspects of current pharmacological literature. Two hours a week. Fall and spring. Cox, Blancafort.

731 [331] SEMINAR IN GENERAL PHARMACOLOGY (1). A series of weekly lecture-seminars by graduate students, faculty members and visiting scientists on current research in pharmacology. One hour a week. Fall. McCarthy.

732 [332] GRANT WRITING (2). Prerequisites, PHCO 701 and permission of the course director. A discussion course covering the elements of successful grant proposals and scientific ethics. Fall, spring and summer. Parise.

733 [221G] DRUG DISCOVERY AND DEVELOPMENT (2). A seminar/discussion course on the research, development and regulatory processes involved in bringing new drugs to clinical use. Spring. (Alternate years.) Carl.

734 [221H] PAIN AND ANALGESIA (2). A lecture/discussion course on pain transmission and pain measurement. The neuropharmacological basis of pain modulation will be discussed. Fall. (Alternate years.) Maixner, Dykstra, Hollins, Light.

735 [221I] DISCOVERY BIOLOGY AND PHARMACOGENOMICS (2). Lecture/discussion course covering a variety of aspects of new biological and computational technologies. The course is predominantly in a lecture format with computer-based and literature assignments. Spring. (Alternate years.) Siderovski, Sondek.

736 [221J] PROTEIN KINASES AS TARGETS FOR NOVEL PHARMACOLOGICAL INHIBITORS (2). A seminar/discussion course to evaluate the use of small molecule inhibitors of protein kinases from a structural and signal transduction perspective. Spring. (Alternate years.) Graves, G. Johnson.

737 [221K] TARGET-BASED DRUG DISCOVERY AND CANCER TREATMENT (2). A lecture/discussion course that emphasizes preclinical and clinical studies for the development of anti-cancer drugs that target signal transduction. Topics include target identification and validation, drug discovery, the process of government approval for clinical trials, design of clinical trials and new genetic-based technologies to foster drug development. Spring, alternate years. Der, Cox.

738 NANOMEDICINE (2). Prerequisite, completion of undergraduate major in physical or biological science or permission of the instructor. This course offers an introduction to the nascent interdisciplinary field of nanomedicine for students with physical/biological science backgrounds; course will be based on student-led discussions of current literature.

750 [250 APPLIED BIOSTATISTICS (CBIO 750, PATH 750, TOXC 750) (1). This largely self-study course will deal with basic statistical and quantitative methods for the analysis and interpretation of biomedical data. This course is required for pharmacology, toxicology and pathology graduate students. Permission of the instructor is required for other students. Fall. Nicholas.

850 [290] SEMINAR IN NEUROBIOLOGY (BIOC 850, NBIO 850, PHYI 850) (3). Prerequisites, one graduate course in the biological sciences and permission of the director of the neurobiology program. An intensive consideration of selected topics and problems. Spring. Members of the neurobiology curriculum.

900 [499] SPECIAL PHARMACOLOGY RESEARCH (3–6).

901 [301] RESEARCH IN PHARMACOLOGY (5 or more). Prerequisite, permission of the staff. Fall, spring and summer. Graves.

911, 912 [211, 212] INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). A course for first-year graduate students majoring in pharmacology. A series of research projects of limited scope, under the supervision of a different faculty member. Twelve laboratory hours a week. Fall and spring. Graves.

913 [213] INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). Prerequisites, PHCO 911 and 912. This is a continuation of PHCO 911 and 912. Six laboratory hours a week, first summer session. Graves.

914 [214] INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). Prerequisites, PHCO 911, 912 and 913. This is a continuation of PHCO 911, 912 and 913. Six laboratory hours a week, second summer session. Graves.

951 [310] RESEARCH IN NEUROBIOLOGY (BIOC 951, NBIO 951, PHYI 951, PSYC 951, BIOL 951) (3–12). Prerequisite, permission of a staff member of the neurobiology program. Research in various aspects of neurobiology. Six to 24 hours a week. Fall and spring. Members of the neurobiology curriculum.

989 [299] SPECIAL PHARMACOLOGY RESEARCH (3–6).

993 [393] THESIS FOR MASTER'S DEGREE (3 or more). Prerequisite, permission of the staff. Fall, spring and summer.

994 [394] DOCTORAL DISSERTATION (3 or more). Prerequisite, permission of the staff. Fall, spring and summer.

Eshelman School of Pharmacy

www.pharmacy.unc.edu
ROBERT A. BLOUIN, *Dean*

Professors

Robert A. Blouin, Effects of Infectious Disease and Trauma on Altered Physiologic States (i.e., Aging and Obesity), and the Expression and Regulation of Drug Metabolizing Enzymes
Kim L. R. Brouwer (62) Hepatobiliary Drug Disposition, Mechanisms of Drug Absorption and Transport, Clinical Pharmacokinetics
Frederick M. Eckel (9) Exploration and Role Development of Pharmacist as Health Team Member
B. W. Hadzija (19) Analysis of Drugs and Their Metabolic Degradation Products
Anthony J. Hickey (86) Pulmonary Drug Delivery, Aerosol Formulations
Leaf Huang (121) Gene Therapy, Targeted Drug Delivery
Harold Kohn (106) Organic, Medicinal and Bio-Organic Chemistry; Mechanisms of Biochemical and Medicinal Processes; Synthesis and Investigation of Heterocyclic Compounds of Medicinal Interest
David Lawrence (133) Application of Chemical Tools to Biological Questions–Enzyme Sensors; Light-Activated Inhibitors, Sensors and Signaling Proteins; Light-Induced Gene Expression; Chemical Genomics
Kuo-Hsiung Lee (13) Medicinal Chemistry of Bioactive Natural Products and Synthetic Analogs Including Antitumor, Anti-AIDS, Antimalarial, Antihepatic, Anti-inflammatory, Anti-Arthritis and Antiviral Agents; Antifungal Antibiotics; Insect Antifeedants; Chinese Herbal Medicine
Howard L. Mcleod (127) Colorectal cancer, Cancer Pharmacogenomics, Translational Pharmacology
Russell J. Mumper (132) Nanoparticle Engineering for Tumor and Dendritic Cell Targeting Vaccines, Biocompatibility, Hemocompatibility and Toxicology of Nanoparticles and Nanomaterials, Mano-adhesive Gels and Thin Films for Mucosal Delivery of Drugs, Vaccines and Microbicides, Anticancer and Anti-inflammatory Properties of Berries and Berry Extracts
Michael D. (Mick) Murray (119) Medication Management Programs, Patient Adherence to Prescription Medications, Pharmacoepidemiology, Pharmaceutical Outcomes Research
J. Herbert Patterson (47) Pharmacokinetic Evaluation of Cardiovascular Drugs
Gary M. Pollack (53) Pharmacokinetics and Pharmacodynamics of CNS Active Agents, Pharmacokinetic Model Development, Toxicokinetics
Bryan Roth (131) Structure and Function of G-protein Coupled Receptors (GPCR)–Atomic Level Analysis of Ligand-Receptor Interactions to In Vivo studies; Serotonin and Opioid Receptor Families
Betsy L. Sleath (91) Provider-Patient Communication, Drug Utilization Review, Patient Compliance, Pharmacoepidemiology
Dhiren R. Thakker (87) Mechanisms of Drug Transport, Pro-Drug Strategies for Enhanced and Targeted Drug Delivery, Disposition of Macromolecules (e.g., Genes)
Alexander Tropsha (81) Molecular Modeling, Computer-Assisted Drug Design, Molecular Dynamics of Proteins, Protein Folding
Xiao Xiao (126) Viral-Based Gene Delivery, Gene Therapy for Muscular Dystrophy and Other Diseases

Associate Professors

Kenneth F. Bastow (84) Design and Testing of Antiviral/Anticancer Drugs
Susan J. Blalock (115) Psychosocial Aspects of Chronic Illness, with Emphasis on Musculoskeletal Disorders
Moo J. Cho (79) Targeted Drug Delivery
Michael B. Jarstfer (112) Use of Synthetic Chemistry and Combinatorial Chemistry to Study Ribonucleoprotein Telomerase–Role in Tumorigenesis
Angela D.M. Kashuba (114) Pharmacogenetics, Pharmacokinetics and Pharmacodynamics of Antiretroviral Agents, Influence of Cytokines on Drug-Metabolizing Enzymes
Richard J. Kowalsky (26) Radiopharmaceuticals
Andrew Lee (111) Structural Biology, NMR Spectroscopy, Protein Dynamics, Biophysical Dissection of Proteins and Protein-Ligand Interactions
Celeste M. Lindley (58) Pharmacogenetics, Pharmacokinetics, and Pharmacodynamics of Antineoplastic Agents and Coagulation Products; Drug Metabolism
Jian Liu (108) Carbohydrate Biochemistry, Structural and Functional Relationships of Heparan Sulfate
Matthew L. Maciejewski (123) Health Economics, Medicare Managed Care, Diabetes Costs and Outcomes, Obesity-Related Quality of Life and Costs
Thomas M. O'Connell, Application of NMR to Metabolomics
A. Wayne Pittman (30) Hypertension, Clinical Pharmacokinetics, Cardiology and Drug Administration
Ralph H. Raasch (32) Infectious Diseases, Parenteral Nutrition
Scott Singleton (116) Bio-Organic and Biophysical Chemical Investigations of the Mechanisms DNA Repair, Directed Evolution of Novel Enzymes, Development of Alternate Strategies for Targeting Drug-Resistant Pathogenic Micro-organisms
Philip C. Smith (85) Pharmacokinetics, Drug Metabolism
Dennis M. Williams (92) Pharmacokinetics and Pharmacodynamics, Inhalation Therapy for Pulmonary Disease, Hypertension
Timothy J. Wiltshire, Mouse Genetics
William C. Zamboni, Translational Studies of Anticancer Agents–Pharmacokinetics, Pharmacodynamics, and Pharmacogenetics in Optimizing Chemotherapeutic Treatment of Cancer, Liposome- and Nanoparticle-based Delivery of Anticancer Agents

Assistant Professors

Joel Farley (124) Evaluation of Public Policies for Prescription Medication, Effect of Medicaid Prescription Cost-containment Policies on Vulnerable Populations
Richard A. Hansen, Prescription Drug Insurance, Pharmaceutical Outcomes, Pharmacoepidemiology, Direct-to-Consumer Advertising
Roy Hawke (118) Pharmacogenetics of Drug Metabolism and Liver Disease, Lipotoxicity, Drug Toxicity
Craig R. Lee (128) Role of Genomics in the Development, Progression, and Treatment of Cardiovascular Diseases, Eicosanoid Metabolism, Endothelial Dysfunction
Rihe Liu (113) Proteomics and Functional Genomics
Mary T. Roth-McClurg (125) Quality of Medication Use and Clinical Outcomes in Older Adults
Qisheng Zhang (130) Endogenous Small Molecule-Regulated Cell Signaling and Relevance to Diseases, Phosphoinositide Signaling, Chemistry and Biology of S-adenosylmethionine, Imaging and Regulating Phosphatase PRL-3

Research Professors

Stephen Frye, Drug Design, Enzyme Inhibitor Design, Protein Kinases

Research Associate Professors

Juan Li, Gene Therapy
Feng Liu, Gene and Drug Delivery
Alexander Golbraikh, Informatics
Susan Morris-Natschke (102) Design, Synthesis and Structural Optimization of Antiviral Phospholipids
Qian Shi

Research Assistant Professors

Arlene P. Bridges, Mass Spectrometry
Lucila Garcia-Contreras, Aerosol Drug Delivery
Peiqi Hu, Gene Therapy
Kyoko Nakagawa-Goto
Mary F. Paine (129) Pharmacokinetics, Drug Metabolism and Transport, Pharmacogenetics
Chunping Qiao, Gene Therapy
A. Naser L. Rezk, Clinical Analytical Chemistry
Hongbing Wang (122) Drug Metabolism and Transport, Drug Resistance in Cancer
Xiang Wang, Molecular Modeling
Donglei Yu, Natural Products Chemistry
Hao Zhu, Molecular Modeling

Clinical Professors

Allen E. Cato, Clinical Drug Trials, Pediatric Diseases, and Pulmonary Medicine
Peter Gal, Pediatric Pharmacotherapy
J. Heyward Hull, Cardiovascular Pharmacology, Clinical Pharmacokinetics, Study Design and Analysis

Clinical Associate Professors

Kimberly H. Deloatch, Educational Media and Instructional Design
Robert E. Dupuis, Clinical Pharmacokinetics, Transplantation

Clinical Assistant Professors

Amanda H. Corbett, Pharmacology of Antiretrovirals, Opportunistic Infection Therapies in Resource-Poor Countries
Stefanie P. Ferreri, Evaluating Pharmaceutical Care in the Community Pharmacy Setting
Adam M. Persky, Pharmacy Education, Pharmacokinetics and Pharmacodynamics of Dietary Supplements
Jo Ellen Rodgers, Cardiovascular and Critical Care Drug Therapy
Christine M. Walko, Clinical Pharmacology of Anticancer Drugs, Clinical Pharmacokinetics of Anticancer Drugs, Cancer Pharmacogenomics

Adjunct Professors

Phill Bowen, Molecular Modeling
Arnold Brossi, Synthesis and Study of Biologically Active Natural Products, Drugs Useful in Malaria Chemotherapy
Patricia Bush, Pediatric and Adolescent Health
Michael Cory, Design, Synthesis and Binding Studies of DNA Intercalating Agents, Quantitative Structure-Activity Relationships, Computer Applications to Drug Design
Michael Crimmins, New Methodology and Synthesis of Natural Products
Joseph DeSimone, Polymer Synthesis, Liquid and Supercritical CO2 Processing, Gene Therapy and Drug Delivery
Marisa Domino
Vijay Gombar, Computer-Aided Drug Design
Klaus Hahn, Tools for Studying Signaling Dynamics
Weili Lin, Magnetic Resonance Imaging
Richard Mailman, Dopamine Receptor Structure and Function
John E. Paul
Lars Pederson, Structural Biology, Heparin Sulfate Enzymes, DNA Repair
Richard Tidwell, Treatment of AIDS-Associated Infections
Connie Vance, Neuropharmacology
Chris Waller, Cheminformatics
Morris Weinberger
Li-An Yeh, Biological Screening
Stanley Young, Cheminformatics
Weifan Zhang, Molecular Modeling
Darryl C. Zeldin, NIEHS

Adjunct Associate Professors

Andrea K. Biddle
David M. Cocchetto, Clinical Pharmacology, Antiviral/Antibacterial Regulatory Affairs
William T. Sawyer, Cardiovascular Therapeutics, Clinical Pharmacy Practice, Biostatistics and Data Management Service
Zhiyang Zhao, Pharmacokinetics and Drug Metabolism

Adjunct Assistant Professors

Jack W. Campbell
Giulia Ghibellini, Clinical Pharmacology and Discovery Medicine Psychiatry
Alicia Gilsenan
Steven R. Moore
Alison A. Motsinger, Pharmacogenetics, Bioinformatics
Cosette Serabjit-Singh, Computational Approaches to Predicting ADME Parameters/Pharmacogenetics
Joshua Thorpe

Professors Emeriti

William Campbell
Dale Christensen
Khalid S. Ishaq
Tom S. Miya
G. Joseph Norwood
Claude Piantadosi
LeRoy D. Werley Jr.
Jack K. Wier

The Eshelman School of Pharmacy offers graduate curricula leading to the master of science and doctor of philosophy degrees in pharmaceutical sciences. Graduate study may be concentrated in disciplinary areas represented by the divisions of medicinal chemistry and natural products, molecular pharmaceutics, pharmaceutical outcomes and policy, and pharmacotherapy and experimental therapeutics.

Instruction emphasizes contemporary research methods and results and is given by means of lectures, recitations and seminars combined with intensive laboratory-based research. The excellent rapport that exists between schools, departments, institutes and centers within the University facilitates interdisciplinary collaborative research by graduate students and faculty. The graduate degree programs also benefit from faculty affiliations with GlaxoSmithKline, Inc., the Research Triangle Institute, Duke University, the Wake Forest University School of Medicine and many other organizations in the Research Triangle Park area.

The Eshelman School of Pharmacy occupies Beard and Kerr Halls, which are located on the Health Sciences campus together with the schools of Dentistry, Medicine, Nursing and Public Health. The Health Sciences Library has an outstanding collection of books and journals as well as computer/support services. Appropriate use also is made of the library and laboratory facilities in other University departments.

Medicinal Chemistry and Natural Products

Medicinal chemistry is an interdisciplinary science. It applies and extends the basic concepts of chemistry, biochemistry and pharmacology to the investigation of biomedical problems. Areas of study include structure-activity relationships, drug-receptor interactions and synthetic drug design. Studies also may include biochemical mechanisms of drug interaction and drug toxicity, isolation of compounds from natural sources and development of analytical methods that apply to all of the above areas of research. Specific research programs within the division focus on isolation of bioactive natural products and synthesis of related analogs, computational chemistry and molecular modeling, neurobiological proteins as targets for drug design, NMR-based techniques to study proteins, proteonomics and nuclear protein enzymology.

Medicinal chemistry is a multidisciplinary field that requires understanding of organic chemistry and related biomedical disciplines such as biochemistry, molecular biology, structural biology, pharmacology and physiology. It interfaces with each of these disciplines and with the use of current methodologies, focusing on learning disease pathways and how drugs function. Research techniques including synthesis, spectroscopy, biochemistry, molecular biology and computational chemistry are linked to identify new therapeutic agents, targets and the pathways by which drugs express their functions. Along with other important facilities, the division has specialized laboratories that conduct cutting-edge research. Focus groups include cancer chemotherapy, computer-aided drug design, enzymology, glycobiology, molecular modeling, natural products, neurochemistry, parasitology and structural biology.

M.S. and Ph.D. programs are offered with a concentration in medici-

nal chemistry and natural products.

Molecular Pharmaceutics

Molecular pharmaceutics represents interdisciplinary specialties encompassing a range of scientific endeavors, including 1) the design, fabrication, evaluation, use of and delivery strategies for dosage forms, 2) elucidation of the behavior of pharmacologic agents in biologic systems, 3) determination of the ability of pharmacologic agents to reach the relevant site of biologic effect and 4) determination of the time course of biologic activity. These areas of specialization represent critical steps in the development of new therapeutic agents, the evaluation of new and existing drugs, and the optimal clinical use of pharmacologic agents.

Students in the Division of Molecular Pharmaceutics are required to participate in a common core of entry-level graduate courses. This core provides a broad perspective of the pharmaceutical sciences, as well as an appreciation for how different subdisciplines interact. Many dissertation projects are collaborative in nature and rely upon interactions with faculty in other divisions of the School of Pharmacy, as well as with colleagues in the School of Medicine, the Department of Chemistry or at pharmaceutical companies or institutions located in the Research Triangle Park area.

Pharmaceutical Outcomes and Policy

Research and education in the Division of Pharmaceutical Outcomes and Policy (DPOP) emphasizes an interdisciplinary approach to solving problems of developing, evaluating, and distributing pharmaceutical products and services. Faculty research interests and course offerings reflect this interdisciplinary orientation.

Education and research in the division draws heavily upon expertise in numerous fields such as health policy, epidemiology, economics and health behavior. DPOP emphasizes research in evaluation of pharmaceutical care and/or pharmaceutical technologies. This includes assessment of processes and outcomes of care from economic, humanistic and clinical perspectives. Assessing and valuing outcomes in the pharmaceutical area is a vital part of the broader mission to improve the performance of the health care system. This is often exemplified in the formation and evaluation of drug policies.

Pharmacotherapy and Experimental Therapeutics

The Division of Pharmacotherapy and Experimental Therapeutics offers a Ph.D. program in the pharmaceutical sciences with a focus on translational research in experimental therapeutics. The goal of this program is to develop an individual who is capable of integrating biomedical and pharmaceutical sciences while maintaining expertise as a clinician. The focus of the program is the development of basic research skills that facilitate evaluation of mechanisms of disease processes and drug therapy. In addition, ongoing clinical experience and advanced course work in pharmacotherapy are integral parts of this program. Students work closely with faculty members who play an active role in the In Vitro In Vivo Correlates of Drug Disposition Scholarly Program, which utilizes preclinical models of absorption, distribution, metabolism and elimination to predict the in vivo disposition of therapeutic agents. Strong therapeutic areas include oncology, infectious diseases/HIV, cardiology and neuropsychopharmacology. Core course work includes molecular biology, biostatistics, analytical methodology and advanced pharmacokinetics/pharmacodynamics. Research projects must include an in vitro and an in vivo component.

Requirements for Admission

Applicants who have completed a standard collegiate curriculum in pharmacy, chemistry, biochemistry, biology or in an allied field in the University, or in other universities or colleges having curricula acceptable to the UNC–Chapel Hill Graduate School, are eligible for admission to the graduate program in pharmaceutical sciences. Applications for admission must be supported by scores on the Graduate Record Examination, letters of recommendation and a statement of personal goals as they relate to graduate study at the UNC–Chapel Hill Eshelman School of Pharmacy.

The Graduate School online application (gradschool.unc.edu) is the standard means of applying for admission. Inquiries concerning admission to programs in the pharmaceutical sciences may be directed to the Office of Research and Graduate Education, CB# 7360, 29 Beard Hall, Chapel Hill, N.C. 27599-7360.

Health-System Pharmacy Administration

The goal of the master of science with a concentration in health system pharmacy is to prepare pharmacists for leadership positions in health care. In order to accomplish this goal, the program will provide students with the knowledge, skills and experience necessary to assume a variety of roles and responsibilities. Our graduates will serve as vibrant, committed professionals with a focus on improving patients' health, health care delivery and the profession of pharmacy. This will occur through both didactic education and experiential opportunities in class and in the workplace.

Graduate Assistantships and Fellowships in the School of Pharmacy

Graduate teaching and research assistantships in the School of Pharmacy provide a stipend of $21,000 for 12 months' service. All awards are made on a competitive basis with consideration given to the applicant's academic record and Graduate Record Examination scores. Information concerning these assistantships, fellowships and traineeships may be obtained by writing directly to the Office of Research and Graduate Education, Eshelman School of Pharmacy.

Medicinal Chemistry

Courses for Graduates and Advanced Undergraduates

MEDC 821 [121] CHEMISTRY OF NATURAL PRODUCTS (3). Prerequisites, CHEM 466 or equivalent and permission of the instructor. An introduction to the isolation, structure determination, biosynthesis and synthesis of bioactive natural products; emphasis on aspects relating to medicinal chemistry. Three hours a week. Spring or fall. Lee, staff.

MEDC 842 [156] THERAPEUTIC PROTEINS (1). This course covers applications of modern information theory and information technologies to biomolecular systems. The core of this course is an overview and practical applications of methods and techniques for the analysis of nucleic acid and protein sequences, sequence-structure and sequence-function correlations.

MEDC 900 [141] INTRODUCTION TO RESEARCH IN MEDICINAL CHEMISTRY (1–3). Prerequisites, CHEM 261, 262, permission of the instructor. One conference and three or more laboratory hours a week. Fall and spring. Staff.

Courses for Graduates

MEDC 804 [168] DRUG DISCOVERY TARGETS I (3). Prerequisites, CHEM 261, 262. Introduction to the principles of design and discovery of effective therapeutic agents. Concepts of physical chemistry, pharmacokinetics and disposition, and analytical techniques in the context of drug design. Spring. Staff.

MEDC 805 [275] MOLECULAR MODELING (BIOC 805) (3). Prerequisites, MATH 231–232, CHEM 481, permission of the instructor. Introduction to computer-assisted molecular design (CAMD) of small molecules. Emphasis on the practical use of molecular and quantum mechanics programs (MM2, MNDO, GAUSSIAN). Two lecture and three to four laboratory hours a week. Fall. Tropsha.

MEDC 806 [276] MACROMOLECULAR MODELING (BIOC 806) (3). Prerequisites, MATH 231–232, CHEM 430 or equivalent. Introduction to modeling and simulation techniques for biological macromolecules. Two lecture and three to four laboratory hours per week. Spring. Tropsha.

MEDC 822 [244] SELECTED TOPICS IN NATURAL PRODUCTS (2). Prerequisites, CHEM 466 and 468. Discussions of important recent developments in the chemistry of natural products of biomedical significance. Spring. Lee, staff.

MEDC 833 [169] MOLECULAR TARGET-BASED DRUG DISCOVERY (3). Prerequisite, MEDC 804. An integrated introduction to molecular target-based drug discovery including bioactive natural products, neuropharmacology, chemical biology and recent advances and techniques in drug discovery. Fall. R. Liu.

MEDC 836 [243] SELECTED TOPICS IN SYNTHETIC MEDICINAL CHEMISTRY (2). Prerequisite, CHEM 460 or equivalent. Discussions from current literature on the strategy and techniques involved in the synthesis of drug molecules. Two lecture hours a week. Spring and fall. Lee, staff.

MEDC 899 [361] SEMINAR (1). Fall and spring.

MEDC 991 [391] RESEARCH IN MEDICINAL CHEMISTRY (1-5). One conference and nine laboratory hours a week per course. Fall or spring. Staff.

MEDC 993 [393] MASTER'S THESIS (3). Fall and spring. Staff.

MEDC 994 [394] DOCTORAL DISSERTATION (3). Fall and spring. Staff.

Molecular Pharmaceutics

Courses for Graduates and Advanced Undergraduates

MOPH 801 [107] NUCLEAR PHARMACY 1 (3). Prerequisites, PHCY 411 and permission of the instructor. Basic principles of radiation physics, instrumentation, radiation safety and radiation biology. Fall. Kowalsky.

MOPH 802 [108] NUCLEAR PHARMACY 2 (3). Prerequisites, MOPH 801 and permission of the instructor. Chemical principles underlying the preparation, regulatory control and use of radioactive drugs in nuclear medicine. Spring. Kowalsky.

MOPH 810 [155] DRUG METABOLISM (3). Prerequisite, permission of the instructor. Introduction to the use of concepts, chemistry, enzymology and techniques in drug metabolism for the design and development of safe and effective therapeutic agents. Spring. (Odd years.) Thakker.

MOPH 840 [171] INTRODUCTION TO RESEARCH (1–3). Prerequisite, permission of the instructor. Students participate in research projects designed to introduce them to research opportunities in the pharmaceutical sciences. Fall and spring. Staff.

MOPH 850 [191] PHARMACEUTICAL ANALYSIS (1). Prerequisite, permission of the instructor. Introduction to quantitative instrumental analysis in pharmaceutics. One lecture hour a week. Fall. (Even years.) Smith.

MOPH 864 [165] ADVANCES IN DRUG DELIVERY (4). Prerequisites, PHCY 410, 411, or equivalent, CHEM 430 or equivalent, permission of the instructor. Elucidation of physiochemical and transport properties of the drug molecule as the determinant of method and route of drug delivery. Fall. (Even years.) Cho.

Courses for Graduates

MOPH 865 [265] TRENDS IN MOLECULAR PHARMACEUTICS RESEARCH (3). Prerequisite, MOPH 864. An interactive course in which students actively participate by critical evaluation and discussion of current literature in the field of drug delivery. Spring. (Odd years.) Staff.

MOPH 890 [253] SPECIAL TOPICS IN ADVANCED PHARMACEUTICS (Var.). Prerequisite, permission of the instructor. A lecture and/or laboratory course designed to present new concepts and innovations in the area of drug delivery and disposition. Fall and spring. Staff.

MOPH 899 [361] SEMINAR (1). Fall and spring. Staff.

MOPH 991 [391] RESEARCH (Var.). Graduate course consisting of laboratory-based research, conferences with the major professor, and library investigations relating to research. One conference and nine laboratory hours a week per course. Fall and spring. Staff.

MOPH 993 [393] MASTER'S THESIS (3). Fall and spring. Staff.

MOPH 994 [394] DOCTORAL DISSERTATION (3). Fall and spring. Staff.

Pharmaceutical Outcomes and Policy

Courses for Graduates

DPOP 800 [180] PHARMACEUTICAL RESEARCH, DEVELOPMENT AND MARKETING (HPAA 650) (3). This course acquaints students with the internal and external environments influencing decision making and management in the discovery, development and marketing of new pharmaceutical products. The course focuses on the pharmaceutical industry with invited lectures by experienced scientists, regulators, policy analysts and corporate managers from the industry. Three lecture hours a week. Spring. (Even years.) Smith.

DPOP 801 [251] PHARMACOECONOMICS (HPAA 653) (3). This course focuses on the empirical investigation of the economic and health impact of major pharmaceutical policies, regulations, market conditions, prescription drug use and pharmaceutical care. Spring. Liu.

DPOP 803 [253] SOCIAL AND BEHAVIORAL ASPECTS OF PHARMACEUTICAL USE (2). This course will draw upon medical sociology and health psychology to familiarize students with core theories, research, measures and design issues relevant to conducting social/behavioral research in pharmaceutical use. Fall. Sleath.

DPOP 804 [254] INFORMATICS: USE OF LARGE HEALTH CARE DATABASES (2). Interdisciplinary course providing practical training in the analysis of large, secondary databases containing physician, hospital and pharmaceutical data. Course topics include data preparation, algorithm development, quality control and dataset limitations. Fall. (Odd years.) Smith.

DPOP 805 [255] PATIENT-REPORTED OUTCOMES: THEORY, METHODS AND APPLICATIONS (3). Course examines theoretical and methodological issues related to the assessment of patient reported outcomes, including health-related quality-of-life, in pharmaceutical research. Current and potential applications are highlighted. Spring. (Even years.) Blalock.

DPOP 806 [260] PHARMACEUTICAL POLICY (3). Course examines policies that influence pharmacy. Structured methods of policy analysis are examined and used to assess theoretic and analytic applications for evaluating pharmaceutical policy. Fall. (Even years.) Hansen.

DPOP 899 [361] SEMINAR (1). Fall and spring. Staff.

DPOP 901 [190] SELECTED TOPICS IN PHARMACEUTICAL OUTCOMES AND POLICY (1–3). A reading and/or special projects course for both undergraduate and graduate students interested in pursuing additional work in the administrative and social sciences as they pertain to pharmacy practice. One to three hours a week. Spring and fall. Staff.

DPOP 902 [203] METHODS IN PHARMACEUTICAL OUTCOMES RESEARCH (3). Includes formulating a research question, stating aims and hypothesis. Students are introduced to formulating a research strategy to write

the background of the protocol, developing a research methodology, addressing measurement issues, selecting an appropriate design, and performing statistical analysis and power calculations. Three lecture hours a week. Fall. Staff.

DPOP 991 [391] RESEARCH IN PHARMACEUTICAL OUTCOMES AND POLICY (1–6). Consists of laboratory work, conferences with the major professor and library investigations relating to research. Fall and spring. Staff.

DPOP 993 [393] MASTER'S THESIS (3). Fall and spring. Staff.

DPOP 994 [394] DOCTORAL DISSERTATION (3). Fall and spring. Staff.

Pharmacotherapy and Experimental Therapeutics

DPET 813 [185] CARDIOVASCULAR PHARMACY (3). Provides an in-depth discussion of the pharmacotherapy of major cardiovascular diseases such as hypolipidemia, hypertension, ischemic heart disease, heart failure and arrhythmias. Fall. Patterson.

DPET 821 [250] PRINCIPLES OF PHARMACY PRACTICE (3). Prerequisite, PHPR 249. Students discuss the modern role of the hospital pharmacist and how the role integrates progressive management with innovative services. The problems with implementing these programs are evaluated. Three lecture hours a week. Spring. Eckel.

DPET 822 [201] ADVANCED CLINICAL PHARMACY (3). Discussions, workshops, and lectures to develop the student's skills and abilities to make therapeutic recommendations, utilize drug literature, educate patients and health professionals, and record observations, plans and actions in a problem-oriented record. Fall and spring. Lindley.

DPET 830 [210] CLINICAL INVESTIGATION OF DRUGS (2). Includes preclinical drug safety evaluation, preclinical pharmacology, design of protocols for Phases I–IV, FDA guidelines for clinical study, preparation of study plan, statistics in clinical trials, data analyzing and FDA interactions with industry. Fall. Cato.

DPET 831 [211] DESIGN AND ANALYSIS OF CLINICAL DRUG TRIALS (2). Discussion of approaches to data analysis of clinical drug studies. Common study designs and their implementation are reviewed. Two lecture hours a week. Spring. Staff.

DPET 840 [200] ADVANCED PHARMACOTHERAPY (3). A modular approach to advanced level pharmacotherapy. Course work using the Pharmacotherapy Self Assessment Program (PSAP) aimed at improving clinical skills and reviewing standards of practice. Fall and spring. Lindley.

DPET 855 [156] PRINCIPLES OF PHARMACOKINETICS (3). Prerequisites, PHCY 413 or equivalent, permission of the instructor. Introduction to pharmacokinetic theory, mathematical model development and data analysis techniques. Fall. (Odd years.) Pollack, Brouwer.

DPET 856 [256] ADVANCED PHARMACOKINETICS AND PHARMACODYNAMICS (4). Prerequisites, MOPH 855, permission of the instructor. Advanced treatment of contemporary pharmacokinetic theory and application, with emphasis on model development, analytical approaches to parameter estimation, and experimental design/data analysis. Spring. (Even years.) Pollack, Brouwer.

DPET 899 [361] SEMINAR (1). Fall and spring. Staff.

DPET 900 [391] RESEARCH IN PHARMACY PRACTICE (1–5). Consists of conferences with major professor; library, laboratory and/or field investigations relating to research. Professor in charge is responsible for the assignments and approval of the subject and character of the degree paper. Staff.

DPET 994 [394] DOCTORAL DISSERTATION (3). Fall and spring. Staff.

Pharmaceutical Sciences (Interdisciplinary)

PHCY 800 [192] APPLIED PHARMACEUTICAL STATISTICS (3). Application of statistical analysis concepts and tools including probability, statistical inference and regression analysis. Experimental design and statistical modeling approaches appropriate to common pharmaceutical research scenarios.

PHCY 801 [195] ETHICS IN RESEARCH (2). Overview of the research process, including hypothesis testing, scientific writing, construction of research proposals and research ethics. Fall. Staff.

Department of Philosophy

www.unc.edu/depts/phildept/phil.htm
GEOFFREY SAYRE-MCCORD, *Chair*

Professors

Dorit Bar-On (29) Philosophy of Language, Philosophy of Mind, Epistemology
Bernard Boxill (26) Social and Political Philosophy, African American Philosophy
Simon Blackburn, Philosophy of Mind, Philosophy of Language, Philosophy of Psychology, Metaethics
Geoffrey Brennan, Political Philosophy, Economics, Rationality
Thomas E. Hill Jr. (24) Ethics, Political Philosophy
Marc Lange (44) Philosophy of Science, Metaphysics, Epistemology
William G. Lycan (22) Philosophy of Mind, Philosophy of Language, Epistemology
Alan Nelson, History of Philosophy, Philosophy of Science
Douglas MacLean (38) Moral Theory, Social and Political Philosophy
Gerald J. Postema (20) Legal Philosophy, Political Philosophy, Ethics
Jesse Prinz (42) Philosophy of Mind, Cognitive Science
C. D. C. Reeve (39) Ancient Philosophy, Metaphysics, Moral Psychology, Ethics
Geoffrey Sayre-McCord (25) Moral Theory, Metaethics, Epistemology, History of Modern Philosophy
Keith Simmons (27) Logic, Philosophy of Language, Philosophy of Mind
Susan Wolf (40) Moral Theory and Moral Psychology

Associate Professors

Thomas Hofweber (42) Metaphysics, Philosophy of Language, Epistemology, Philosophy of Mathematics
John T. Roberts (37) Philosophy of Science, Philosophy of Physics, Metaphysics

Assistant Professors

Joshua Knobe (46) Cognitive Science, Moral Philosophy, Philosophy of Psychology
Matthew Kotzen Epistemology, Philosophy of Science
Ram Neta (43) Epistemology, Philosophy of Mind
Ryan Preston Political Philosophy, Moral Philosophy, Philosophy of Religion

Lecturers

Warren A. Nord (34) Philosophy of Religion, Philosophy of Education
Jeanette M. Boxill (33) Social and Political Philosophy, Feminism

Adjunct Professors

Michael Corrado, Philosophy of Law
Rebecca Walker, Bioethics, Ethical Theory

Professors Emeriti

Edward Galligan
Douglas Long
Stanley Munsat
Michael Resnik
George Schlesinger
Richard A. Smyth
Robert D. Vance

The graduate courses in philosophy are designed to present and discuss classics, current literature and basic problems, to stimulate critical and

original philosophical thought and to prepare students for college and university positions in philosophy.

The Department of Philosophy offers a program of study leading to the degrees of master of arts and doctor of philosophy. Prerequisite for admission to graduate work in the department is a B.A. degree or equivalent, typically with a major in philosophy, with a broad range of courses.

Candidates for the master's degree must satisfactorily complete 30 semester hours of graduate work. They are normally required to participate in a first-year program including PHIL 700 and PHIL 455; there may be adjustments with the consent of the department. Successfully completing an M.A. thesis is a condition for receiving the degree of master of arts.

Candidates for the doctoral degree must satisfactorily complete 60 semester hours of graduate work, including six hours of Ph.D. dissertation credit.

The candidate for the degree of doctor of philosophy must pass two examinations. First, there is the Admission to Candidacy examination, which itself has two parts—a written general portion and a special oral portion. The written portion, normally taken in the spring term of the third year, is in the student's field of specialization. The oral portion tests the feasibility of the dissertation proposal and is normally taken in the fall term of the fourth year. Second, there is an oral defense of the completed dissertation. For further details on degree requirements, see the Graduate Degree Requirements section of this catalog.

The department offers several nonservice fellowships. These include the Graham Kenan Fellowship and the Horace Williams, Mary Taylor Williams and Bertha Colton Williams Fellowships. The department has available teaching assistantships with stipends of $14,000. In addition, The Graduate School offers a variety of fellowships and assistantships with stipends up to $18,000 that are open to students in philosophy.

The department maintains close relations with the Department of Philosophy at Duke University. Graduate students in either institution may register for credit in graduate courses or seminars at the other institution for a nominal fee and without special matriculation. Library facilities are available to students at each institution.

Courses for Graduates and Advanced Undergraduates

(Prerequisite, one course below 400 or consent of the instructor.)

411 [151] ARISTOTLE (3). An examination of some representative works of Aristotle, with reference to common emphases and basic problems, together with an analysis of their philosophic content. Fall or spring. Reeve.

412 [150] PLATO (3). An examination of some representative works in the context of contemporary scholarship. Fall or spring. Reeve.

415 [152] TOPICS IN MEDIEVAL PHILOSOPHY (3). An intensive study of some medieval philosophical author (e.g., Aquinas, Scotus or Ockham) or topic (e.g., arguments for the existence of God, universals, knowledge of individuals). Spring.

421 [153] RATIONALISM (3). An examination of the view of the rationalist philosophers (Descartes, Spinoza and Leibniz) that reasoning can give us knowledge of the world and of our place in it. Fall or spring. Nelson.

422 [154] EMPIRICISM (3). An examination of the view of the empiricist philosophers (Locke, Berkeley and Hume) that the only way to gain knowledge of the world is by means of the senses. Fall or spring. Nelson, Sayre-McCord.

423 [155] KANT (3). An intensive introduction to Kant's accounts of space, time, concepts, perception, substance, causation and the thinking self through a careful study of his masterwork, The Critique of Pure Reason. Fall or spring. Rosenberg, Hill.

427 [156] HEGEL (3). In-depth study of Hegel's systematic philosophy emphasizing its roots in Kant's critical philosophy. Primary focus on Phenomenology of Spirit, supplemented by selections from the Encyclopedia and Philosophy of Right. Fall or spring. Postema.

428 [159] HISTORY OF AMERICAN PHILOSOPHY (3). Transcendentalists, pragmatists, Quine, Rorty and others. Fall or spring. B. Boxill.

432 [114] THE BEGINNINGS OF ANALYTIC PHILOSOPHY (3). Prerequisites, two courses in philosophy other than PHIL 155 or permission of the instructor. Frege, Russell, Moore and Wittgenstein among other are considered. Fall or spring. Neta, Rosenberg, Lycan.

433 [116] CURRENT ISSUES IN ANALYTIC PHILOSOPHY (3). Prerequisites, two courses in philosophy other than PHIL 155 or permission of the instructor. Recent work in epistemology and metaphysics. Fall or spring. Bar-On, Lycan, Prinz, Rosenberg.

440 [117] PHILOSOPHY OF MIND (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 340 recommended) or permission of the instructor. An examination of dualism, behaviorism, the identity theory and forms of functionalism with special focus on the problems of mental aboutness. Fall or spring. Bar-On, Lycan, Neta, Prinz.

445 [110] PHILOSOPHY OF LANGUAGE (LING 445) (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 345 recommended) or permission of the instructor. How does language represent? Does it mirror the structure of the world? Does it reflect the structure of the mind? Fall or spring. Lycan, Bar-On.

450 [108] PHILOSOPHY OF NATURAL SCIENCES (3). Concept formation, verifiability, law, explanation, the role of logic and mathematics in the sciences, and other topics. Fall or spring. Lange, Roberts.

451 [122] PHILOSOPHY OF PHYSICS (3). Topics may include the nature of space and time, the ontological status of fields and energy, or causation and locality in quantum physics. Fall or spring. Lange, Roberts.

452 [123] PHILOSOPHY OF BIOLOGY (3). The logical structure of evolutionary theory, fitness, taxonomy, the notion of a living thing, reductionism, evolutionary explanations, teleology. Fall or spring. Lange, Roberts.

453 [109] PHILOSOPHY OF PSYCHOLOGY (3). Topics may include reasoning, the relationship between language and thought, concepts, moral cognition and emotions. Fall or spring. Knobe, Prinz

454 [107] PHILOSOPHY, HISTORY AND THE SOCIAL SCIENCES (3). The nature of historical explanation, structural and functional explanation, the weighing of historical testimony, the concept of meaning, normative judgments and predictions in the social sciences. Fall or spring.

455 [101] SYMBOLIC LOGIC (LING 455) (3). Introduction for graduates and advanced undergraduates not taking the PHIL 155–356 sequence. Fall. Hofweber, Simmons.

456 [111] ADVANCED SYMBOLIC LOGIC (3). Prerequisite, PHIL 455 or permission of the instructor. Presupposes propositional and quantificational logic as a basis of further deductive development with special attention to selected topics: alternative systems, modal and deontic logic, inductive logic, the grammar of formalized languages, paradoxes and foundations of mathematics. Fall or spring. Simmons.

457 [190] SET THEORY AND LOGIC (3). Prerequisite, PHIL 455 or permission of the instructor. Natural and real numbers. Infinite cardinal and ordinal numbers. Alternative axiom systems and their consistency problems. Fall or spring. Hofweber, Simmons.

459 [106] PHILOSOPHY OF MATHEMATICS (3). Prerequisite, PHIL 455

or permission of the instructor. Philosophical problems concerning logic and the foundation of mathematics. Fall or spring. Hofweber, Simmons.

460 [102] SELECTED TOPICS IN THE HISTORY OF MORAL PHILOSOPHY (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 360 recommended) or permission of the instructor. Examination of classic texts of Plato, Aristotle, Aquinas, Hobbes, Butler, Hume, Kant and Mill. Selections may vary from year to year. Fall. Hill, Maclean, Reeve, Sayre-McCord, Wolf.

462 [112] CONTEMPORARY MORAL PHILOSOPHY (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 362 recommended) or permission of the instructor. Fact and value, reason and morality, the nature of morality. Fall of spring. Hill, Sayre-McCord, Wolf.

463 [120] CONTEMPORARY MORAL AND SOCIAL PROBLEMS (3). Prerequisites, two courses in philosophy other than PHIL 155 or permission of the instructor. A detailed examination of one or more of the following contemporary issues: environmental ethics, animal rights, abortion, euthanasia, pornography, racism, sexism, public versus private morality. Fall or spring. B. Boxill, Brennan, Hill, MacLean, Sayre-McCord.

465 [175] JUSTICE IN HEALTH CARE (3). Prerequisite, one course in philosophy or permission of the instructor; medical students welcome. The course will focus on the question of how scarce health care resources ought to be distributed in order to meet the demands of justice. Spring. Walker.

468 [168] RISK AND SOCIETY (3). Prerequisites, PHIL 155 and one other course or permission of the instructor. The course examines attitudes toward risk and how they affect our preferences for different public policies in the areas of environmental protection, technology regulation and workplace and product safety. Spring. Maclean.

470 [105] POLITICAL PHILOSOPHY FROM HOBBES TO ROUSSEAU (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 170 or 370 recommended) or permission of the instructor. Explores the foundations of justice and authority in the idea of contract or covenant, the nature of law, rights, liberty and democracy in the work of Hobbes, Locke, Hume, Rousseau. Fall or spring. B. Boxill, Hill, Postema.

471 [104] HEGEL, MARX AND THE PHILOSOPHICAL CRITIQUE OF SOCIETY (3). An examination of central issues in social and political philosophy as they figure in the work of Hegel, Marx, Nietzsche and others. Fall or spring. Postema.

473 [160] AMERICAN POLITICAL PHILOSOPHY (3). Prerequisites, junior/senior status and one course in the Department of Philosophy other than PHIL 155. The issue of unity and diversity in America is analyzed through the writings of Jefferson, the Federalists and Anti-Federalists, Calhoun, MacKinnon, DuBois and Rawls. Fall or spring. B. Boxill

474 FOUNDATIONS OF MODERN POLITICAL PHILOSOPHY (3). Prerequisite, PHIL 170 or equivalent or permission of the instructor. This course traces the emergence and development of central themes of modern political philosophy from the 13th through the 17th century.

475 [165] PHILOSOPHICAL ISSUES IN GENDER, RACE AND CLASS (WMST 475) (3). Prerequisite, PHIL 275, WMST 101 or permission of the instructor. Examines in greater depth and complexity one or more of the issues addressed in PHIL 275, investigating issues of gender, race and class within the dominant theories of philosophy. J. Boxill.

476 [130] RECENT DEVELOPMENTS IN POLITICAL PHILOSOPHY (3). Prerequisites, two courses in philosophy other than PHIL 155 (PHIL 370 recommended) or permission of the instructor. Investigation of major contemporary contributors (Rawls, Nozick, Dworkin, Cohen, Waldron, Arrow) to philosophical debate concerning justice, equality, liberty, democracy, public reason or rights versus community. Spring. B. Boxill, Brennan, MacLean, Postema.

480 [113] PHILOSOPHY OF LAW (3). An exploration of whether and under what conditions the state has the right to control crime by punishment of past crimes and preventive detention to prevent future crimes. Fall or spring. Postema.

482 [142] PHILOSOPHY AND LITERATURE (CMPL 482) (3). Philosophical readings of literary texts, including novels, plays, and poems. Fall or spring. Reeve.

485 [103] PHILOSOPHY OF ART (3). Competing theories of art and art criticism. The relationship between art and emotional expression, the formal character of art, and standards of taste. Fall or spring.

494 [158] EXISTENTIALISM AND PHENOMENOLOGY (3). A study of one or two major systematic works by Sartre, Heidegger, or Merleau-Ponty. Fall or spring.

495 [178] HEALTH CARE, SCIENCE AND PHILOSOPHY (3). Interdisciplinary course to develop critical thinking capacities through philosophical study of the nature of scientific presuppositions and concepts, including events, causality, and determinism, with specific application to health care issues. Walker.

560 ETHICS BOWL (3). Prerequisites, PHIL 160 or equivalent and one other ethics course above 300. Ethics Bowl provides a unique experiential opportunity for students to apply theory to practical global issues. Students will prepare cases to present locally and at Ethics Bowl competition.

698 PHILOSOPHY, POLITICS AND ECONOMICS II: CAPSTONE COURSE (ECON 698, POLI 698) (3). Prerequisites, PHIL 384 and permission of the instructor. This capstone course advances PHIL 384, focusing on such theoretical and philosophical issues as the analysis of rights or distributive justice and the institutional implications of moral forms.

Courses for Graduates

700 [200] PROTO-SEMINAR IN PHILOSOPHY (3).

705 [205] ADVANCED STUDIES IN SYSTEMATIC PHILOSOPHY (3).

710 [210] ADVANCED STUDIES IN ANCIENT PHILOSOPHY (3).

715 [215] ADVANCED STUDIES IN MEDIEVAL PHILOSOPHY (3).

720 [220] ADVANCED STUDIES IN MODERN PHILOSOPHY (3).

725 [225] ADVANCED STUDIES IN 1-CENTURY PHILOSOPHY (3).

730 [230] ADVANCED STUDIES IN METAPHYSICS (3).

735 [235] ADVANCED STUDIES IN EPISTEMOLOGY (3).

740 [240] ADVANCED STUDIES IN PHILOSOPHY OF MIND (3).

745 [245] ADVANCED STUDIES IN PHILOSOPHY OF LANGUAGE (LING 745) (3).

750 [250] ADVANCED STUDIES IN PHILOSOPHY OF SCIENCE (3).

755 [255] ADVANCED STUDIES IN PHILOSOPHY OF LOGIC (3).

760 [260] ADVANCED STUDIES IN MORAL THEORY (3).

765 [265] ADVANCED STUDIES IN VALUE THEORY (3).

770 [270] ADVANCED STUDIES IN POLITICAL PHILOSOPHY (3).

775 [275] ADVANCED STUDIES IN FEMINISM (WMST 775) (3).

780 [280] ADVANCED STUDIES IN PHILOSOPHY OF LAW (3).

790 [290] COLLOQUIUM SERIES SEMINAR (3).

800 [300] PRE-DISSERTATION SEMINAR IN PHILOSOPHY (3).

805 [305] RESEARCH SEMINAR IN SYSTEMATIC PHILOSOPHY (3).

810 [310] RESEARCH SEMINAR IN ANCIENT PHILOSOPHY (3).

815 [315] RESEARCH SEMINAR IN MEDIEVAL PHILOSOPHY (3).

820 [320] RESEARCH SEMINAR IN MODERN PHILOSOPHY (3).

825 [325] RESEARCH SEMINAR IN NINETEENTH-CENTURY PHILOSOPHY (3).

830 [330] RESEARCH SEMINAR IN METAPHYSICS (3).

835 [335] RESEARCH SEMINAR IN EPISTEMOLOGY (3).

840 [340] RESEARCH SEMINAR IN PHILOSOPHY OF MIND (3).

845 [345] RESEARCH SEMINAR IN PHILOSOPHY OF LANGUAGE (3).

850 [350] RESEARCH SEMINAR IN PHILOSOPHY OF SCIENCE (3).

855 [355] RESEARCH SEMINAR IN PHILOSOPHY OF LOGIC (3).

860 [360] RESEARCH SEMINAR IN MORAL THEORY (3).

865 [365] RESEARCH SEMINAR IN VALUE THEORY (3).

870 [370] RESEARCH SEMINAR IN POLITICAL PHILOSOPHY (3).

880 [380] RESEARCH SEMINAR IN PHILOSOPHY OF LAW (3).

890 [390] CURRENT RESEARCH GROUP SEMINAR (3).

993 [393] MASTER'S THESIS.

994 [394] DOCTORAL DISSERTATION.

Department of Physics and Astronomy

www.physics.unc.edu
LAURIE E. MCNEIL, *Chair*

Professors

Bruce W. Carney (32) Optical Observational Astrophysics
Gerald N. Cecil (47) Optical Observational Astrophysics
Arthur E. Champagne (51) Experimental Nuclear Physics and Astrophysics
Wayne A. Christiansen (4) Theoretical Astrophysics, Radio Astronomy
Thomas B. Clegg (5) Nuclear Physics, Polarization Phenomena
J. Christopher Clemens (64) Observational Astronomy, Astrophysics, Astronomical Instrumentation
Louise A. Dolan (49) Theoretical Particle Physics, Quantum Gravity
Jonathan Engel (57) Theoretical Nuclear Physics
Charles R. Evans (48) Gravity, Relativity, Theoretical Astrophysics
Paul H. Frampton (33) Theoretical Particle Physics (Including Gravity)
Christian G. Iliadis (61) Experimental Nuclear Astrophysics
John P. Hernandez (10) Condensed Matter Theory, Electron States
Hugon J. Karwowski (37) Experimental Nuclear Physics and Astrophysics
Dmitri V. Khveshchenko (1) Theoretical Physics
Jianping Lu (56) Condensed Matter Theory
Laurie E. McNeil (36) Solid State, Optical and Transport Properties of Disordered Solids
Y. Jack Ng (30) Theoretical Particle Physics, Gravitation
James A. Rose (41) Galactic and Extragalactic Astronomy
Lawrence G. Rowan (18) Electron Paramagnetic Resonance, Physics of Music, Electronics
Richard Superfine (55) Experimental Studies of Interfaces, Biophysics
Frank Tsui (59) Experimental Condensed Matter and Materials Physics
Sean Washburn (50) Experimental Condensed Matter and Low Temperature Physics
Yue Wu (54) Nuclear Magnetic Resonance, Electron Spin Resonance in Solids
Otto E. Zhou (62) Materials Science, Nanotechnology

Associate Professors

Lu-Chang Qin (27) Materials Science, Nanotechnology
Daniel E. Reichart (13) Gamma Ray Bursts, Early Universe, Interstellar Extinction, Galaxy Clusters
Paul H. E. Tiesinga (6) Computational and Theoretical Neuroscience, Biophysics

Assistant Professors

Reyco Henning (11) Neutrino Physics, Particle Astrophysics
Sheila Kannappan (14) Observational Extragalactic Astronomy
Rene Lopez (25) Experimental Condensed Matter Physics
Laura Mersini (19) Theoretical Cosmology

Research Professor

Robert K. McMahan Jr. (53) Stellar Evolution and Cosmology

Research Associate Professors

Michael R. Falvo, Condensed Matter Physics
Alfred Kleinhammes, Condensed Matter Physics, Materials Science
Nalin R. Parikh (58) Solid State Physics, Materials Science
Russell M. Taylor II, Nanotechnology, Computer Imaging
Research Assistant Professor
E. Timothy O'Brien, Physics Related to Biology, Light Microscopy, Biological Sample Preparation

Adjunct Professors

William W. Clark III, Electronics, Optics
Richard T. Hammond, General Relativity, Gravity, Optics
Ryan M. Rohm, Quantum Field Theory, Theoretical Particle Physics
John E. Rowe, Materials Science, Nanotechnology
Jie Tang, Materials Physics, Nanomaterials

Adjunct Associate Professors

John D. Hunn, Applied Condensed Matter Physics
Brian R. Stoner, Applied Materials Science
A. Christopher Thompson, High Energy Astrophysics

Adjunct Assistant Professor

Bower, Nanotechnology
Yueh Lee, Nanotechnology

Professors Emeriti

Wayne A. Bowers
C. Victor Briscoe
Sang-Il Choi
Morris S. Davis
Kian S. Dy
William M. Hooke
Paul S. Hubbard
Horst Kessemeier
Edward J. Ludwig
J. Ross Macdonald
Eugen Merzbacher
Earl N. Mitchell
Everett D. Palmatier
Dietrich Schroeer
Stephen M. Shafroth
Lawrence M. Slifkin
William J. Thompson
Hendrik Van Dam
James W. York Jr.

The Department of Physics and Astronomy offers graduate work leading to the degrees of master of science and doctor of philosophy.

The active fields of research are condensed-matter physics, microelectronics, nuclear physics, neutrino physics and nuclear astrophysics, quantum field theory, theoretical particle physics, general relativity and gravitation, extragalactic and stellar astronomy, and astrophysics. The chemical physics program combines courses from chemistry and physics with research in either department. Students can also work in the UNC–Chapel Hill biophysics program. The graduate courses are

designed to give students a broad foundation and to introduce them to the special fields in which the research interests of the department lie.

The general regulations of The Graduate School govern the work for the degrees of master of science and doctor of philosophy. To begin a graduate program in physics or astrophysics, the student should have completed the requirements for the degree of bachelor of science with a major in physics at the University, or their equivalent elsewhere. The minimum prerequisite for graduate study consists of the basic undergraduate courses PHYS 116, 117, 128, 128L, 301, 302, 341, 415, 311, 312, together with MATH 232, 233 and 524. At the end of the spring semester a student who does not already have a degree in physics or astronomy must take the M.S. written examination. The examination is based upon the graduate student's first-year course work and will cover dynamics, quantum mechanics I, statistical mechanics and electromagnetic theory I.

The M.S. degree in physics may be taken with or without thesis. However, even if a thesis is not submitted, a student must work with a research group for at least one semester, in order to learn the research techniques in a field of physics or astronomy. If the research is theoretical, the student must also gain experimental experience. A minor is not required for the M.S. degree, but one may be chosen in accord with the regular graduate requirements for this option. The equivalent of one semester teaching experience is required of all M.S. degree candidates. The M.S. astrophysics track must include ASTR 701 and a minimum of six hours from ASTR 519, 702, 703 or 704.

The requirements for a Ph.D. in physics for students entering in 2008 are a) successful completion of the following core courses in the department, or completion of their equivalents elsewhere as an undergraduate or graduate student: 701, 711, 712, 741, 721 and 722; b) passing the Ph.D. written examination based on core graduate courses in physics as listed in a), c) gaining experimental experience either through master's or doctoral research, or (if student's research is theoretical) by performing an experimental project deemed adequate by the director of graduate studies, d) taking a course outside his or her field of specialization from a list approved by the director of graduate studies and e) passing at least three other advanced graduate-level courses appropriate to his or her field of specialization. A Ph.D. candidate must also take a preliminary doctoral oral examination within the first three years of graduate study in physics at UNC–Chapel Hill. The oral examination is concerned mainly with the student's dissertation research project. A minor is not required, but may be elected, in which case requirement c) above is replaced by the requirement that the student pass at least five graduate-level courses selected from no more than two departments, with no fewer than two courses in either department. The minor program must be approved in advance by the minor department. Teaching experience, as part of professional training, is required of all doctoral candidates. This experience can be gained through laboratory or lecture instruction as a teaching assistant, either for two semesters or until teaching competence is acquired.

The astrophysics Ph.D. track requirements are similar except that the course requirements are PHYS 701, 711, 721, 741 and ASTR 701, 702, 703, 704, 705 and an additional 700-level course. To gain familiarity with experimental astrophysics or observational astronomy, a student must pass ASTR 519/719,earn an M.S. degree which involves experimental or observational research in astrophysics, or perform other experimental/observational research deemed suitable by the director of graduate studies.

Research Interests

Astronomy and Astrophysics. Research includes the structure and evolution of stars, our Milky Way galaxy, other galaxies, gamma ray bursters and cosmology. Theory involves numerical relativity and sources of gravitational radiation, stellar seismology and quasars. UNC–Chapel Hill has guaranteed observing time on the 4.1-meter SOAR Telescope in Chile, which began regular operations in 2004, and on the 11-meter SALT Telescope in South Africa, which began operations in 2005. UNC–Chapel Hill operates a number of smaller robotic telescopes as well.

Biological Physics, Nanobiotechnology, Computational Neurophysics. Theoretical and computational studies include the dynamics of the nervous system and information-theoretical analysis of multineuronal data. Experimental studies include manipulation and force measurement techniques with applications to DNA, molecular motors and cilia.

Condensed-Matter Physics. Experimental and theoretical studies of nanomaterials. Atomic scale studies of devices and nanoelectromechanical systems, including quantum computation and transport, actuating nanomotors and sensors, amorphous materials, semiconductors, superconductors, the optical properties of solids, properties of metal-atom fluids, charge transport in solids and fluids, epitaxial growth, magnetic materials and heterostructures, and ion beam modification and analysis of solids.

Field Theory, Particle Physics, Cosmology, Gravitation and Relativity. Research includes gauge field theories, quantum chromodynamics, electroweak theory, grand unified theories, string theory, supersymmetry, supergravity, quantum gravity, theoretical cosmology, numerical relativity, gravitational radiation and relativistic astrophysics.

Materials Science and Materials Physics. Experimental and theoretical research in the design, synthesis, integration and characterization of novel solid state materials, including nanostructured materials such as quantum dots, carbon nanotubes and nanorods, quasi-crystals, and metallic glass. Applications of novel materials for energy storage, electron field emission, probes and sensors, and data storage. Applications include flat-panel displays, an X-ray system for biomedical imaging and rechargeable batteries.

Nuclear Physics. Experimental and theoretical work involves in neutrino oscillations and neutrino mass measurements, fundamental symmetries and weak interactions in supernovae. The structure and evolution of stars and nucleosynthesis are investigated using nuclear probes. The nature of the nuclear force and properties of few-body systems. Polarized beams of light ions and gamma-rays and polarized 3He target. Applied nuclear physics.

Facilities and Equipment

Research in physics and astronomy is carried out in laboratories on and off the Chapel Hill campus. Within Phillips Hall and Chapman Hall there are several major research laboratories including the "nanomanipulator" (a combination of a scanning electron microscope, an atomic force microscope and sophisticated visualization graphics), the new Keck Laboratory for Atomic Imaging and Manipulation, which includes two transmission electron microscopes, and the Goodman Laboratory for Astronomical Instrumentation. Other facilities include apparatus for nuclear magnetic resonance studies, scanning probe microscopes and Raman and optical spectrometers. For synthesis and fabrication, major facilities include molecular beam epitaxy, microwave plasma enhanced chemical vapor deposition, laser ablation, photoli-

thography and reactive ion etching, and ion implantation.

A 2.8-MeV Van de Graff accelerator and a 200-keV ion implantation machine are located within the building, as are nanomaterials production and experimental facilities. The department is a partner in the Triangle Universities Nuclear Laboratory and plays a major role in experiments using the Laboratory for Nuclear Astrophysics (LENA), Tandem accelerator, and the High-intensity Gamma-ray Source at the Free Electron Laser facility. UNC–Chapel Hill has a 0.6-meter on-campus telescope, and is a major partner in the 4.1-meter SOAR Telescope in Chile and the 11-meter Southern African Large Telescope (SALT) in South Africa. The department operates the PROMPT array of robotic telescopes in Chile and manages the SkyNet array of robotic telescopes. Numerous national laboratories, including Oak Ridge, Brookhaven, Los Alamos and Argonne, as well as KamLAND, NRAO, NOAO, the Hubble Space Telescope and the Chandra X-ray Observatory, are also vital parts of our research efforts.

Fellowships and Assistantships

Many teaching assistantships (with stipends of $16,290 for nine months) are available to qualified graduate students. The duties of assistants include supervising laboratory classes in elementary physics or astronomy, assisting in the supervision of advanced laboratories, teaching recitation sections and grading papers. Graduate School fellowships, including a microelectronics fellowship for first-year students, are available for well-qualified applicants to the department's graduate program. Teaching assistants can usually be supported in the summer by teaching or research.

Research assistantships are also offered, especially to those who have completed a year or two of graduate work. The stipend is $21,720 for the calendar year. Summer employment is usually available.

Application forms for admission, including graduate appointments, should be completed online at gradschool.unc.edu/students_prospective.html, or may be downloaded from the Web at www.physics.unc.edu.

Courses for Graduates and Advanced Undergraduates

* ASTR 301 is not to be taken for graduate credit by graduate students in physics and astronomy.

Astronomy (ASTR)

***301 [117] COSMIC EVOLUTION** (3). Prerequisites, MATH 232 and ASTR 101 (or permission of the instructor). A course in stellar and planetary astrophysics with emphasis on astronomical conditions for the development and sustenance of life. Fall or spring. Christiansen, staff.

501 [142] ASTROPHYSICS I (STELLAR ASTROPHYSICS) (3). Prerequisites, MATH 383 and PHYS 128, or permission of the instructor. An introduction to the study of stellar structure and evolution. Topics covered include observational techniques, stellar structure and energy transport, nuclear energy sources, evolution off the main-sequence and supernovae. Fall. Carney, Christiansen, Rose.

502 [143] ASTROPHYSICS II (INTERSTELLAR MATTER AND GALAXIES) (3). Prerequisites, MATH 383 and PHYS 128, or permission of the instructor. An introduction to the study of the structure and contents of galaxies. Topics covered include the interstellar medium, interstellar hydrodynamics, supersonic flow and shock formation, star formation, galactic evolution, the expanding universe and cosmology. Spring. Carney, Christiansen, Rose.

519 [137] OBSERVATIONAL ASTRONOMY (4). Prerequisite, ASTR 101 or permission of the instructor. A course designed to familiarize the student with observational techniques in optical and radio astronomy, including application of photography, spectroscopy, photometry and radio methods. Three lecture and three laboratory hours a week. Fall or spring. (Alternate years.) Rose, staff.

701 [244] PHYSICAL PROCESSES IN STELLAR ATMOSPHERES AND INTERIORS (3). Prerequisites, PHYS 711 and 721. Equation of transfer, continuous and line opacities, model atmospheres, spectral line formation. Equations of stellar structure, energy transport, nuclear reaction rates, modeling stellar evolution. Spring. Carney.

702 [242] HIGH ENERGY ASTROPHYSICS (3). Prerequisites, PHYS 711 and 721. White dwarfs and neutron stars: physical properties and observational manifestations. Extragalactic radio sources, relativistic jets and supermassive black holes. Particle acceleration and radiative processes in hot plasmas. Accretion phenomena. X-ray and gamma-ray astrophysics. Fall. Evans.

703 [243] GALACTIC DYNAMICS AND PHYSICAL PROCESSES IN THE INTERSTELLAR MEDIUM (3). Prerequisites, PHYS 701 and 721. Collisionless and collisional stellar dynamics, disk dynamics and spiral structure, encounters between stellar systems. Physical processes in diffuse gases, HII regions and supernova remnants, ionization and energy balance of the interstellar medium, star formation. Fall. Rose.

704 [245] EXTRAGALACTIC ASTROPHYSICS (3). Corequisite, PHYS 701. Hubble law; morphology of galaxies (mass distributions, ages, dynamics), clusters of galaxies, isotropy and voids, microwave background, large-scale structure, Robertson-Walker metric, standard cosmology, Big Bang nucleosynthesis, thermodynamics of expanding universe, inflation, formation of structure. Fall or spring. Cecil.

705 ASTROPHYSICAL ATMOSPHERES (3). Prerequisites PHYS 711 and PHYS 721. Radiative transfer, opacities, spectral line formation, energy transport, models, chemical abundance determination, interstellar chemistry, magnetic fields. Applications to observations of planetary, stellar and solar, galactic (ISM) and intergalactic gaseous atmospheres.

719 [237] ASTRONOMICAL DATA (4).

891 [350] SEMINAR IN ASTROPHYSICS (1–21). Recent observational and theoretical developments in stellar, galactic and extragalactic astrophysics. Fall and spring. Staff.

Physics (PHYS)

** PHYS 301–302 and 311–315 are not to be taken for graduate credit by graduate students in physics.

****301 [103] MECHANICS I** (3). Prerequisites, PHYS 117 (or permission of the instructor) and MATH 233. Particle kinematics, central forces, planetary motions, systems of particles, conservation laws, nonlinearity. Statics, motion of rigid bodies. Langrange's and Hamilton's equations, Euler's equations. Vibrations and waves. Spring. Washburn, staff.

****302 [104] MECHANICS II** (3). Prerequisite, PHYS 301. Advanced topics in mechanics. Fall. Staff.

311 [107], **312 [108] ELECTRICITY AND MAGNETISM (3 each). Prerequisites, PHYS 117 (or permission of the instructor). Brief treatment of DC and AC circuit theory. Electrostatics, dielectrics, the magnetic field, magnetic materials. Maxwell's equations and their application to electromagnetic waves. Fall and spring. Clegg.

****313 [113] SPACE AND TIME IN PHYSICS AND PHILOSOPHY** (3). Contingent and necessary properties of space and time. The direction and flow of time. Fatalism. Effects preceding their causes. Spring. Van Dam, staff.

321 [160] INTRODUCTION TO QUANTUM MECHANICS (3). Prerequisite, PHYS 301, MATH 383 or permission of the instructor. Origins of quantum theory. Uncertainty principle. Schroedinger equation for simple systems, including hydrogen atom. Perturbation theory. Spin. Identical particles. Spring. Khevshchenko.

331 [061] INTRODUCTION TO NUMERICAL TECHNIQUES IN PHYSICS (4). Prerequisite, PHYS 116 (or PHYS 105); corequisite, MATH

233. Applications of calculus, vector analysis, differential equations, complex numbers and computer programming are made to realistic physical systems. Three lecture and two computational laboratory hours a week. Spring. Staff.

341 [105] HEAT AND THERMODYNAMICS (3). Prerequisites, PHYS 117 (or PHYS 105 by permission of the instructor) and MATH 233. Equilibrium statistical mechanics; the thermodynamics laws, internal energy, enthalpy, entropy, thermodynamic potentials. Maxwell equations. Fall. Wu.

351 [101] ELECTRONICS I (4). Prerequisites, introductory physics and MATH 231, or permission of the instructor. DC and AC circuit analysis, pn junctions and diodes, single-transistor circuits, transducers, op amps, analog devices. Applications in research and industry. Extensive circuit building with testing, trouble shooting and debugging. Fall. Karwowski.

352 [102] ELECTRONICS II (4). Prerequisite, PHYS 351 or permission of the instructor. Advanced topics in analog and digital electronics. Computers and device interconnections, converters and data acquisition. Signal analysis and digital filters. Graphical (LabVIEW) programming and computer interfacing. Individual projects and practical applications. Spring. Karwowski.

405 BIOLOGICAL PHYSICS (3) Prerequisites, PHYS 116 and 117. How diffusion, entropy, electrostatics, and hydrophobicity generate order and force in biology. Topics include DNA manipulation, intracellular transport, cell division, molecular motors, single molecule biophysics techniques, nerve impulses, neuroscience.

410 TEACHING AND LEARNING PHYSICS (4). Prerequisite, PHYS 116, 117 or permission of the instructor. Learning how to teach physics using current research-based methods. Includes extensive fieldwork in high school and college environments. Meets part of the licensure requirements for North Carolina public school teaching.

415 [106] OPTICS (3). Prerequisites, PHYS 311 and 312 (or 211 by permission of the instructor). Elements of geometrical optics; Huygens' principles, interference, diffraction and polarization. Elements of the electromagnetic theory of light; Fresnel's equations, dispersion, absorption and scattering. Photons. Lasers and quantum optics. Spring. McNeil.

422 [122] PHYSICS OF THE EARTH'S INTERIOR (GEOL 422) (3). Prerequisites, MATH 383 and either PHYS 201 and 211, or 301 and 311. Origin of the solar system: the nebular hypothesis. Evolution of the Earth and its accretionary history. Earthquakes: plate tectonics and the interior of the Earth. The Earth's magnetic field. Mantle convection.

424 [124] GENERAL PHYSICS I (4). PHYS 104 equivalent, specifically for certification of high school teachers.

425 [125] GENERAL PHYSICS II (4). PHYS 105 equivalent, specifically for certification of high school teachers.

471 [140] PHYSICS OF SOLID STATE ELECTRONIC DEVICES (3). Prerequisite, PHYS 117. Pre- or corequisite, PHYS 211 or 311. Properties of crystal lattices, electrons in energy bands, behavior of majority and minority charge carriers, PN junctions related to the structure and function of semiconductor diodes, transistors, display devices. Fall. McNeil.

472 [144] CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (APPL 472, CHEM 472, MTSC 472) (3). Prerequisites, CHEM 482 or PHYS 117 and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronic devices. Crystal growth, thin film deposition and etching, and microlithography. Spring. Zhou.

481 [142L] ADVANCED LABORATORY I (2). Prerequisite, PHYS 351 or 352 or permission of the instructor. Selected experiments illustrating modern techniques such as the use of laser technology to study the interaction of electromagnetic fields and matter. Six laboratory hours a week. Fall and spring. McNeil.

482 ADVANCED LABORATORY II (2). Prerequisite, PHYS 481 or permission of the instructor. Independent laboratory research projects. Scientific writing and oral presentations, abstracts and reports. Six laboratory hours per week.

491L [148L] MATERIALS LABORATORY I (APPL 491L) (2). Prerequisite, APPL 470 and PHYS 351. Structure determination and measurement of the optical, electrical and magnetic properties of solids. Fall. McNeil.

492L [492] MATERIALS LABORATORY II (APPL 492L) (2). Prerequisite, APPL 491L or PHYS 491L. Continuation of PHYS 491L with emphasis on low- and high-temperature behavior, the physical and chemical behavior of lattice imperfections and amorphous materials, and the nature of radiation damage. Spring. Parikh

521 [163] APPLICATIONS OF QUANTUM MECHANICS (3). Prerequisite, PHYS 321. Emphasizes atomic physics but includes topics from nuclear, solid state and particle physics, such as energy levels, the periodic system, selection rules and fundamentals of spectroscopy. Fall. Khevshchenko.

543 [161] NUCLEAR PHYSICS (3). Prerequisite, PHYS 321 or equivalent. Structure of nucleons and nuclei, nuclear models, forces and interactions, nuclear reactions. Spring. Champagne.

545 [165] INTRODUCTORY ELEMENTARY PARTICLE PHYSICS (3). Prerequisites, PHYS 312 and 321. Relativistic kinematics, symmetries and conservation laws, elementary particles and bound states, gauge theories, quantum electrodynamics, chromodynamics, electroweak unification, standard model and beyond. Spring. Staff.

573 [169] INTRODUCTORY SOLID STATE PHYSICS (MTSC 573) (3). Prerequisite, PHYS 321 or equivalent. Crystal symmetry, types of crystalline solids; electron and mechanical waves in crystals, electrical and magnetic properties of solids, semiconductors; low temperature phenomena; imperfections in nearly perfect crystals. Fall. Hernandez.

595 [175] NONLINEAR DYNAMICS (3). Prerequisite, MATH 383 or permission of the instructor. Interdisciplinary introduction to nonlinear dynamics and chaos. Fixed points, bifurcations, strange attractors, with applications to physics, biology, chemistry, finance. Spring. Engel.

631 [191] MATHEMATICAL METHODS OF THEORETICAL PHYSICS I (3). Prerequisites, MATH 383 and PHYS 128 or equivalent. Vector fields, curvilinear coordinates, functions of complex variables, linear differential equations of second order, Fourier series, integral transforms, delta sequence. Fall. Dolan.

632 [192] MATHEMATICAL METHODS OF THEORETICAL PHYSICS II (3). Prerequisite, PHYS 631 or permission of the instructor. Partial differential equations, special functions, Green functions, variational methods, traveling waves and scattering. Spring. Dolan.

633 [193] SCIENTIFIC PROGRAMMING (3). Prerequisites, MATH 528 or 529 or PHYS 631 or 632; elementary Fortran, C or Pascal programming. Structured programming in Fortran or Pascal; use of secondary storage and program packages; numerical methods for advanced problems, error propagation and computational efficiency; symbolic mathematics by computer. Spring. Staff.

660 [151] FLUID DYNAMICS (ENVR 452, GEOL 560, MASC 560) (3). Prerequisite, PHYS 301 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Fall. Bane.

671L [181L] INDEPENDENT LABORATORY I (3). Prerequisites, PHYS 301 and 312, or permission of the instructor. Six laboratory hours a week. Fall and spring. McNeil.

672L [182L] INDEPENDENT LABORATORY II (3). Prerequisites, PHYS 301 and 312, or permission of the instructor. Six laboratory hours a week.

Courses for Graduates

*The PHYS 821 and PHYS 896 sequence alternates with PHYS 822–823.

701 [203] CLASSICAL DYNAMICS (3). Prerequisite, advanced undergraduate mechanics. Variational principles, Lagrangian and Hamiltonian mechanics. Symmetries and conservation laws. Two-body problems, perturbations, and small oscillations, rigid-body motion. Relation of classical to quantum mechanics. Fall. Engel.

711 [204] ELECTROMAGNETIC THEORY I (3). Prerequisites, PHYS 631–632 or equivalent. Electrostatics, magnetostatics, time-varying fields, Maxwell's equations. Spring. Evans.

712 [205] ELECTROMAGNETIC THEORY II (3). Prerequisite, PHYS 711 or equivalent. Plane electromagnetic waves and wave propagation, wave guides and resonant cavities, simple radiating systems, scattering and diffraction, special theory of relativity, radiation by moving charges. Fall. Evans.

715 [215] VISUALIZATION IN SCIENCE (COMP 715, MTSC 715) (3).

721 [260], 722 [261] QUANTUM MECHANICS (3 each). Prerequisite, PHYS 321 or equivalent. Review of nonrelativistic quantum mechanics. Spin, angular momentum, perturbation theory, scattering, identical particles, Hartree-Fock method, Dirac equation, radiation theory. Fall and spring. Lu.

741 [221] STATISTICAL MECHANICS (3). Prerequisites, PHYS 701 and 721. Classical and quantal statistical mechanics, ensembles, partition functions, ideal Fermi and Bose gases. Spring. Ng.

771L [201L], 772L [202L] ADVANCED SPECTROSCOPIC TECHNIQUES (3 each). Prerequisite, PHYS 301, PHYS 312 or permission of the instructor. Advanced spectroscopic techniques, including Rutherford backscattering-channeling, perturbed angular correlation, Raman scattering, electron paramagnetic resonance, nuclear magnetic resonance, optical absorption and Hall effect. PHYS 771 (fall) has two hours of lecture and three hours of laboratory a week; PHYS 772 (spring) has one hour of lecture and five hours of laboratory a week. McNeil.

***821 [262] ADVANCED QUANTUM MECHANICS** (3). Prerequisite, PHYS 722. Advanced angular momentum, atomic and molecular theory, many-body theory, quantum field theory. Fall. (Alternate years.) Dolan.

***822 [263], *823 [264] FIELD THEORY** (3 each). Prerequisite, PHYS 722. Quantum field theory, path integrals, gauge invariance, renormalization group, Higgs mechanism, electroweak theory, quantum chromodynamics, Standard Model, unified field theories. Fall and spring. (Alternate years.) Dolan, Frampton.

824 [291] GROUP THEORY AND ITS APPLICATIONS (3). Prerequisites, knowledge of matrices, mechanics and quantum mechanics. Discrete and continuous groups. Representation theory. Application to atomic, molecular, solid state, nuclear and particle physics. As announced. Dolan.

827 [288] PRINCIPLES OF CHEMICAL PHYSICS (CHEM 788) (3). Prerequisite, PHYS 321 or CHEM 781 or permission of the instructor. The quantum mechanics of molecules and their aggregates. Atomic orbitals, Hartree-Fock methods for atoms and molecules. Special topics of interest to the instructor and research students. As announced.

829 [290] PRINCIPLES OF MAGNETIC RESONANCE (3). Prerequisite, PHYS 721 or CHEM 781 or permission of the instructor. Fall or spring, as announced. Wu.

831 [274] DIFFERENTIAL GEOMETRY IN MODERN PHYSICS (3). Prerequisites, PHYS 701, 711, 712. Applications to electrodynamics, general relativity and nonabelian gauge theories of methods of differential geometry, including tensors, spinors, differential forms, connections and curvature, covariant exterior derivatives and Lie derivatives. Fall or spring, as announced. Staff.

832 [275] GENERAL THEORY OF RELATIVITY (3). Prerequisite, PHYS 831 or permission of the instructor. Differential geometry of space-time. Tensor fields and forms. Curvature, geodesics. Einstein's gravitational field equations. Tests of Einstein's theory. Applications to astrophysics and cosmology. Fall or spring, as announced. Evans.

861 [230], 862 [231] NUCLEAR PHYSICS (3 each). Prerequisites, PHYS 543 and 721. Nuclear interactions at nonrelativistic energies. Charge and spin dependence in nuclear reactions. Decay modes and electromagnetic properties. Collective and single particle states. Fall and spring. (Alternate years.) Engel.

871 [270], 872 [271] SOLID STATE PHYSICS (MTSC 871, 872) (3 each). Prerequisite, PHYS 321 or equivalent. Topics considered include those of PHYS 573, but at a more advanced level, and in addition a detailed discussion of the interaction of waves (electromagnetic, elastic and electron waves) with periodic structures, e.g., X-ray diffraction, phonons, band theory of metals and semiconductors. Fall and spring. Hernandez.

873 [272] THEORY OF THE SOLID STATE (3). Prerequisite, PHYS 722. Calculation of one-electron energy band structure. Electron-hole correlation effect and excitons. Theory of spin waves. Many-body techniques in solid state problems including theory of superconductivity. As announced. Lu.

883 [267] CURRENT ADVANCES IN PHYSICS (3). Prerequisite, permission of the instructor. In recent years, elementary particle physics, amorphous solids, neutrinos and electron microscopy have been among the topics discussed. Fall or spring, as announced. Staff.

Research Courses

893 [370] SEMINAR IN SOLID STATE PHYSICS (1–21). Research topics in condensed-matter physics, with emphasis on current experimental and theoretical studies. Fall and spring. Washburn.

895 [360] SEMINAR IN NUCLEAR PHYSICS (1–21). Current research topics in low-energy nuclear physics, especially as related to the interests of the Triangle Universities Nuclear Laboratory. Fall and spring. Karwowski.

***896 [380] SEMINAR IN PARTICLE PHYSICS** (1–21). Symmetries, gauge theories, asymptotic freedom, unified theories of weak and electromagnetic interactions, and recent developments in field theory. Fall and spring. Dolan.

897 [310] SEMINAR IN THEORETICAL PHYSICS (1–21). Topics from current theoretical research including, but not restricted to, field theory, particle physics, gravitation and relativity. Fall and spring. Mersini.

899 [322] SEMINAR IN PROFESSIONAL PRACTICE (1–21). Prerequisite, Ph.D. written exam passed. The role and responsibilities of a physicist in the industrial or corporate environment and as a consultant. Fall, spring and summer. Graduate faculty.

901 [301] RESEARCH (1–21). Ten or more laboratory or computation hours a week. Fall and spring. Staff.

992 [392] MASTER'S RESEARCH PROJECT (3–6). Fall or spring. Staff.

993 [393] MASTER'S THESIS (3–6). Fall or spring. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Fall or spring. Staff.

Department of Political Science

www.unc.edu/depts/polisci
EVELYNE HUBER, *Chair*

Professors

Thad Beyle (3) State and Local, Policy Studies
Thomas Carsey (67) American Politics, Methods
Pamela Conover (10) Political Psychology, Mass Political Behavior, Gender Politics
Virginia Gray (40) State Politics, Public Policy, Interest Groups
Jonathan Hartlyn (46) Comparative Politics, Latin American Politics
Liesbet Hooghe (04) Comparative Politics, European Union, West European Politics
Evelyne Huber (54) Comparative Politics, Political Economy, Latin American Politics
Michael Lienesch (38) History of Political Thought, American Political Theory
Stuart Elaine Macdonald (39) Political Behavior, Public Opinion, Research Methods
Michael MacKuen (66) American Politics, Political Methodology
Gary Marks (18) Comparative Politics, Western Europe
Timothy McKeown (22) International Relations, International Political Economy

George Rabinowitz (25) Elections, Political Parties, Statistical Methods
Lars Schoultz (20) U.S.-Latin American Relations
Donald Searing (30) Comparative Politics, Political Psychology
Jeffrey Spinner-Halev (11) History of Political Thought, Contemporary Political Theory, Democratic Theory
Jurg Steiner (31) Comparative Politics, Ethics in Politics
John Stephens (55) Political Economy, Western Europe, Caribbean
James Stimson (65) American Politics, Political Methodology
James White (34) Comparative Politics, Urban Politics, East Asia-Japanese Politics

Associate Professors

Susan Bickford (58) History of Political Thought, Feminist Theory, Democratic Theory
Mark Crescenzi (05) International Politics, Conflict Processes, Political Economy
Michele Hoyman (06) American Politics, Public Administration, Labor Relations and Labor Law, Rural Economic Development
Stephen Leonard (15) History of Political Thought, Philosophy of Social and Political Inquiry, Republicanism, History of the Academic Disciplines
Kevin McGuire (60) Judicial Politics, American Politics
Thomas Oatley (57) International Relations, International Political Economy, European Countries
Andrew Reynolds (13) Comparative Politics, Political Institutions, African Politics
Terry Sullivan (47) Congressional and Executive Politics
Isaac Unah (62) Judicial Politics, Regulatory Policy, Bureaucratic Implementation
Georg Vanberg (17) American Politics, Comparative Politics, Formal Modeling

Assistant Professors

Navin Bapat (68) International Relations, Insurgency and Terrorism
Erik Engstrom (14) American Politics, Legislative Politics
Stephen Gent (8) International Conflict, Civil Conflict, Game Theory
Cecilia Martinez-Gallardo (69) Comparative Politics, Latin American political institutions, Government Formation and Change
Layna Mosley (9) International Relations, International Political Economy,Comparative Political Economy
Graeme Robertson (7) Comparative Politics, Russian Politics, Labor and Social Movements, Democratization
Milada Vachudova (12) Comparative Politics, International Institutions, Western and Eastern European Politics

Professors Emeriti

Raymond Dawson
Lewis Lipsitz
Duncan MacRae
Richard Richardson
Robert Rupen
Glenn Snyder
Alan Stern
Deil Wright

The Department of Political Science offers courses of study leading to the master of arts in political science, the master of arts in political science with a certificate in Latin American studies and the doctor of philosophy in political science.

Admission

The general prerequisite for admission to graduate study is a bachelor of arts degree or equivalent. A student is not required to have an undergraduate major in political science but will normally be expected to have had at least nine semester hours of course work in political science.

All applicants for admission to graduate study must take the Graduate Record Examination (GRE). Prospective applicants should take the test early enough to enable them to submit official reports of scores with their application for admission. In considering applications for fellowship awards, these test scores receive heavy emphasis. Applicants are encouraged to have their applications complete by December 1. Applicants are also required to submit a writing sample and a personal statement.

Graduate Study in Political Science

Departmental programs of graduate study are intended to train professional political scientists. Thus graduate work is expected to be qualitatively different from undergraduate work. Its emphasis is upon the acquisition of tools, skills and knowledge at a level to qualify the student to: carry on research, to teach, to fill active political and administrative duties and to carry on other roles that advance the profession of practicing political scientists.

All candidates for graduate degrees will be expected to achieve broad mastery at the professional level of the literature, problems and skills of the academic fields and subfields offered for the degree, and will have gained experience in teaching and research. Much more is required of the candidate than mere compilation of credits in relevant courses.

At the M.A. level, the student is required, in addition to passing the course programs successfully, to write a thesis and to be examined orally on the major field of interest and in defense of the thesis.

At the doctoral level, preliminary examinations are both written and oral, in that order. Written examinations are given twice each year, in September and in the spring semester. The final part of the examination is an oral defense of the dissertation proposal. Successful completion of these examinations permits a student to become a doctoral candidate. Following completion of the dissertation, a final oral examination will be held, which is primarily a defense of the dissertation but may include such excursions into underlying theory and related fields as are germane to the dissertation.

Field and Course Requirements

The political science curriculum is designed to ensure that graduate students develop a professional competence in the discipline as a whole, as well as expertise in one major and one minor field. The courses in the department are grouped under the following broad categories: international relations, comparative politics, political theory, American politics, methodology and public policy/public administration (minor field only).

Ph.D. students are required to demonstrate competence in two fields of study and, by participating in the instructional program, to undergo training as teachers. A minimum of four courses and a comprehensive examination is required in the major field. A comprehensive examination and three courses are required in the minor field.

The Institute of Latin American Studies and the Graduate Certificate

The Institute of Latin American Studies and the Consortium in Latin American Studies at UNC–Chapel Hill and Duke University serve as a medium for interdisciplinary communication on Latin America, encouraging and stimulating instruction and research on the region. They provide funding for interdisciplinary working groups, visiting scholars, research workshops and guest lectures, as well as support for graduate students through academic year and summer fellowships and research and conference travel grants. The program has been funded as a National Resource (Title VI) Center since 1991 by the U.S. Department of Education.

Although the University of North Carolina at Chapel Hill does not grant an interdisciplinary postgraduate degree in Latin American studies, graduate students seeking to document their area expertise are

encouraged to earn a certificate in Latin American studies in conjunction with any advanced degree in any University graduate program. The requirements for the certificate are 1) a minimum of two semesters of residence, 2) language competence in Spanish or Portuguese, 3) four graduate courses on Latin American topics, 4) a thesis on a topic related to Latin America and 5) an oral defense of the thesis. For students in professional schools or departments that do not require defense of a thesis, a letter from the student's advisor indicating that a major research project on a Latin American topic was successfully completed will be sufficient to waive the requirement. Graduate students interested in obtaining a certificate in Latin American studies should contact the director of the Institute of Latin American Studies.

The Center for European Studies

The Center for European Studies (CES) and the European Union Center of Excellence (EUCE) provide a focus for interdisciplinary and political research on Europe by funding faculty course development, research projects, research working groups and travel as well as funding graduate student research, travel and foreign language learning. In recent years the center has hosted international conferences on the European Union, regional regimes, comparative social policy and the political economy of capitalist democracies as well as hosting three doctoral dissertation workshops in conjunction with European universities. Graduate students are always closely involved in our conferences and activities. The center has established a master's degree program with tracks in Transatlantic Relations and European Governance in consortium with European and American universities. CES is funded as a National Resource Center by the U.S. Department of Education and as a European Union Center of Excellence by the European Comission. We are also network coordinators for all commission-funded EU centers in the United States.

Center for Slavic, Eurasian and East European Studies

The Center for Slavic, Eurasian and East European Studies (CSEEES) is an interdisciplinary center run jointly with a sister center at Duke University. In addition to offering an undergraduate major in Russian and East European studies, the center actively promotes graduate education and research in this area of the world.

As a U.S. Department of Education Title VI Center, CSEEES awards Foreign Language and Area Studies (FLAS) fellowships to a few graduate students each academic year and summer to help them acquire the language skills and area expertise necessary for advanced study and field research in this part of the world.

The Louis Harris Data Center

The national polling company Harris Interactive (formerly Louis Harris & Associates) has been surveying Americans' opinions on issues of national importance since the late 1950s. Harris surveys cover many topics, including national morale, the arts, energy policy, women's roles, political candidates, violence, health and housing. The breadth and scope of the Harris surveys make them a rich source for secondary analysis by social scientists.

In 1965, Louis Harris agreed to make his data available for secondary analysis by researchers. Harris and the University of North Carolina jointly agreed to establish at Chapel Hill the Louis Harris Data Center as the national archive for all Harris data. Since 1965, more than 200 national, state and community studies conducted by Harris Interactive have been deposited at the Harris Data Center for use by researchers at the University and elsewhere.

Publications

The James Sprunt Studies in History and Political Science, established by the late Dr. James Sprunt, of Wilmington, North Carolina, is published under the direction of the departments involved.

Courses for Graduates and Advanced Undergraduates

295 [190] DOMESTIC POLICY SEMINAR (PLCY 295) (3). Taught as part of the UNC–Chapel Hill Washington Policy Seminar, the course introduces students to domestic policy making from the federal perspective using readings and lectures from the Washington policy making community.

400 [172] EXECUTIVE POLITICS (3). This course explores how presidents select policy options, how they decide timing, what shapes their congressional support and how they build successful coalitions. Spring. Sullivan.

401 [117] POLITICAL ECONOMY I: THE DOMESTIC SYSTEM (3). Problems of the national government in managing capitalist development and economic growth; political constraints; patterns of conflict among domestic actors. Fall. Stimson.

404 [102] RESEARCH IN URBAN POLITICS (3). Prerequisite, POLI 100 or 101. Examines contemporary research programs on urban politics conducted by political scientists. These topics will be examined both in terms of substantive findings and research methodology. Fall and spring. Lowery.

405 [134] NORTH CAROLINA POLITICS AND PUBLIC POLICY (3). An intensive study of politics, government, and public policy in the state of North Carolina. Emphasis is placed on student research projects, with a major paper the main requirement. Fall. Staff.

406 STATE GOVERNMENTS: LABORATORIES OF DEMOCRACY (3). Advanced topics in state government and politics, including political behavior and processes, governmental institutions, public policies. Emphasis on how states serve as the laboratories of democracy in a federal system.

407 [132] HEALTH POLITICS AND POLICY (3). An analysis of health care policy in the United States with selective comparisons from health care systems in other developed democratic societies. Spring.

408 [169] BUSINESS-GOVERNMENT RELATIONS (3). Explores the nonmarket environment of firms and policy makers. Topics include the media, lobbying, antitrust, regulation, product safety, international trade, globalization and corporate ethics. Emphasis on class discussion and presentation. Spring. Staff.

409 [154] MOCK CONSTITUTIONAL CONVENTION (3). Students employ their understanding of political philosophy and practical politics to write a new constitution for the United States. Emphasis is on creative blending of theory and practice. Fall. MacKuen.

410 [155] THE CONSTITUTION OF THE UNITED STATES (3). A study of the fundamental principles of constitutional interpretation and practice in the United States by means of lectures, textbooks and cases. Emphasis will be on the political context surrounding and the impact following Supreme Court decisions. Fall. McGuire.

411 [157] CIVIL LIBERTIES UNDER THE CONSTITUTION (3). An analysis of the complex political problems created by the expansion of protection for individual liberties in the United States. Emphasis will be on contemporary problems with some supplemental historical background. Spring. Unah, McGuire.

412 [170] UNITED STATES NATIONAL ELECTIONS (3). Course studies United States presidential and congressional elections. Emphasis on individual vote, changing party strengths and the relation of outcomes to policy. Spring. Rabinowitz.

414 [151] THE ADVERSARY SYSTEM (3). An overview of the theories, problems and practices of police, courts and corrections, and the values underlying our adversary system, especially with relation to constitutional principles, judicial integrity and racial discrimination. Fall. LeFebvre.

415 [159] CRIMINAL LAW (3). This course is concerned with traditional substantive criminal law: crime, defenses and excuses to criminal liability, issues of morality attached to criminal law, constitutional limitations on punishments. Spring. LeFebvre.

416 [153] CONSTITUTIONAL POLICIES AND THE JUDICIAL PROCESS (PWAD 416) (3). Analysis of the structure and functions of judicial systems emphasizing the organization, administration, and politics of judicial bureaucracies and roles of judges, juries, counsel, litigants and interested groups in adjudication processes. Fall. Unah.

417 [167] ADVANCED POLITICAL PSYCHOLOGY (3). Prerequisite, POLI 215, 216 or 697. Examines in greater depth issues in the field of political psychology, including conflict and conflict resolution, socialization, attitude formation, mass movements, leader-follower relationships and psychobiography. Spring.

418 [174] MASS MEDIA AND AMERICAN POLITICS (3). Prerequisites, POLI 100 and junior-senior standing. Examination of the role, behavior and influence of the mass media in American politics. MacKuen.

419 [171] RACE, POVERTY, AND POLITICS (3). Definitions of poverty and their policy implications; the composition and causation of poverty; an examination of public policies directed at the alleviation, reduction and elimination of poverty. Spring. Staff.

420 [178] LEGISLATIVE POLITICS (3). Examines the politics of the United States Congress. Emphasis on representation, the legislative process and policy making. Fall. Engstrom.

421 EQUALITY UNDER THE UNITED STATES CONSTITUTION (3). An analysis of the legal and political issues regarding equality as interpreted by the United States Supreme Court.

422 CONSTITUTIONAL FREEDOMS IN THE UNITED STATES (3). A historical and analytic examination of the fundamental freedoms contained in the Bill of Rights, including speech, press and religion.

423 PEACE SETTLEMENTS IN ETHNICALLY DIVIDED SOCIETIES (3). Examines political peace settlements as components of conflict resolution in ethnically or regionally divided societies. The course identifies the aspects of negotiated settlements which seek to manage civil conflict.

430 [128] EUROPEAN POLITICS (3). Prerequisite, POLI 239. Active participation of students in a research project on career motives and ethical principles in European countries. Fall and spring. Staff.

431 AFRICAN POLITICS AND SOCIETIES (3). Prerequisite, AFRI 101 or POLI 131 or 241. The problems of race, class and ideology are explored in the countries south of the Zambezi River, along with the political and economic ties that bind these countries.

432 [113] TOLERANCE IN LIBERAL STATES (3). Prerequisite, POLI 100 or 239. This course will compare the theory and practice of tolerance in the United States and Europe, with particular attention to Great Britain and France. Spring. Searing.

433 [115] POLITICS OF THE EUROPEAN UNION (INTS 433) (3). Prerequisites, two prior courses in political science or international studies. Examines the politics and political economy of institutional change and policy making in the European Union in comparative perspective. Fall, spring and summer. Hooghe

434 [116] POLITICS OF MEXICO, CENTRAL AMERICA, AND THE CARIBBEAN (3). Prerequisite, POLI 238 or permission of the instructor. The analysis of politics in Mexico, Central America and the Caribbean. Fall or spring. Hartlyn, Huber.

435 [127] DEMOCRACY AND DEVELOPMENT IN LATIN AMERICA (3). Prerequisite, POLI 238 or permission of the instructor. The analysis of central issues of democracy and development in Latin America. Fall or spring. Hartlyn, Huber.

436 [127S] DEMOCRACY AND DEVELOPMENT IN LATIN AMERICA (Spanish) (3). Prerequisites, POLI 238 and SPAN 101–204 or equivalent intermediate-level language knowledge, or permission of the instructor. The analysis of central issues of democracy and development in Latin America. Spring. Hartlyn.

437 POLITICAL CHANGE IN ASIA (3). This course will address how various nations in Asia are handling the pressures of democratization, the globalization of "democratic norms," and internal challenges to authoritarian regimes. Spring.

438 [121] DEMOCRACY AND INTERNATIONAL INSTITUTIONS IN AN UNDIVIDED EUROPE (INTS 438) (3). Explores the collapse of communist rule in 1989 and the reaction of international institutions to the challenges of democratization, economic transition, ethnic conflict, and European integration in an undivided Europe. Fall and spring. Vachudova.

439 [114] COMPARATIVE EUROPEAN SOCIETIES (SOCI 439) (3). Examination of commonalities and differences of European societies and of the tensions and difficulties attending the European integration process. Fall. Marks.

440 [123] GOVERNMENT AND POLITICS IN JAPAN (ASIA 440) (3). Examines the Japanese political process in the period since World War II with emphasis on popular culture and behavior, and on governmental policy making in both domestic and foreign affairs. Previous course work on east Asia recommended but not required. Spring. White.

442 [140] INTERNATIONAL POLITICAL ECONOMY (EURO 442) (3). Prerequisites, ECON 101 and POLI 150. Theories of international political economy, major trends in international economic relations, selected contemporary policy issues. Fall. McKeown, Oatley.

443 [144] AMERICAN FOREIGN POLICY: FORMULATION AND CONDUCT (PWAD 443) (3). Prerequisite, POLI 150 or permission of the instructor. The role of Congress, the press, public opinion, the president, the secretary and the Department of State, the military and the intelligence community in making American foreign policy. Emphasis is placed on the impact of the bureaucratic process on the content of foreign policy. Spring. Staff.

446 [149] DEFENSE POLICY AND NATIONAL SECURITY (AERO 446, PWAD 446) (3). Prerequisite, POLI 150 or permission of the instructor. A study of national defense policy as affected by the constitutional and political setting, as well as its relation to foreign policy. Some attention to strategic doctrine. Crescenzi.

447 [150] THEORY OF WAR (PWAD 447) (3). Examines the nature, purposes and conduct of war. Emphasizes interaction between political and military phenomena; introduces the study of strategy and its relationship to domestic and international politics. Staff.

449 [141] HUMAN RIGHTS AND INTERNATIONAL CRIMINAL LAW (3). This course examines international efforts to punish genocide, crimes against humanity and war crimes. The evolution of international criminal law, jurisdiction, remedies, problems, alternatives and recent case studies is included.

450 [147] CONTEMPORARY INTER-AMERICAN RELATIONS (PWAD 450) (3). Prerequisite, POLI 231 and/or 238 or PWAD 231. A comprehensive analysis of hemispheric international relations and foreign policies of individual Latin American nations.

456 [145] CONTEMPORARY INTERNATIONAL RELATIONS OF THE UNITED STATES (3). Prerequisite, POLI 150 or permission of the instructor. A study of selected United States foreign policy problems since World War II; analysis of the process of policy formulation and the impact of the external environment and domestic policies on the White House and Department of State. Staff.

457 INTERNATIONAL CONFLICT PROCESSES (3). Prerequisite, POLI 150 or permission of the instructor. Analysis of international conflict and the causal mechanisms that drive or prevent conflict. Emphasis is on the conditions and processes of conflict and cooperation between nations. Fall. Crescenzi.

459 [122] THE UNITED STATES AND RUSSIA (3). A comparative inquiry into contrasting cultures, values, attitudes and behavior patterns: Why can't and why don't the Russians want to be like Americans? Fall. Staff.

469 CONFLICT AND INTERVENTION IN THE FORMER YUGOSLAVIA (PWAD 469, RUES 469) (3). Focuses on ethnic and political conflicts in the former Yugoslavia and efforts by the international community to end conflict and promote peace and reconstruction.

470 [161] SOCIAL AND POLITICAL PHILOSOPHY (3). An examination of the logic of social and political thought with an analysis of such concepts as society, state, power, authority, freedom, social and political obligation, law, rights. Fall or spring.

471 [166] RECENT CONTEMPORARY POLITICAL THOUGHT (3). Survey of the historical foundations, central tenets and political consequences of prominent 20th-century political theories. Topics include contemporary liberalism and Marxism, fascism, theories of development, populism, feminism. Fall or spring. Leonard.

472 [165] PROBLEMS OF MODERN DEMOCRATIC THEORY (3). Major problem areas in democratic theory including definitions, presuppositions and justifications of democracy, liberty, equality, minority rights, public interest, participation, dissent and civil disobedience. Fall. Bickford, Lienesch.

473 POLITICS AND LITERATURE (3). Identifies and interprets political ideas using historical and contemporary literary sources. Examines literature as political practice.

474 RELIGION AND POLITICS (3). Examines the relationship between religion and politics, with emphasis on the United States. Topics include church-state issues, religious-political movements, religion and public policy, religion and voting.

475 [163] MARXISM AND SOCIALISM (3). A consideration of the political thought of major Marxist and socialist schools—including Marxism, Leninism, contemporary democratic and revolutionary socialism—with reference to utopian socialism and recent controversies on the left. Fall. Staff.

477 [164] ADVANCED FEMINIST POLITICAL THEORY (WMST 477) (3). Prerequisite, POLI/WMST 265. Examines in greater depth and complexity current issues in feminist political theory. Topics: theories of subjectivity and solidarity, feminist poststructuralist and post-Marxist thinking, gender in the public sphere. Fall and spring. Bickford.

697 [094B] THEORY AND PRACTICE OF REPRESENTATIVE GOVERNMENT (3). Theories of representative government with special emphasis upon those derived from modern social choice theory.

698 PHILOSOPHY, POLITICS ,AND ECONOMICS II: CAPSTONE COURSE (ECON 698, PHIL 698) (3). Prerequisites, PHIL 384 and permission of the instructor. This capstone course advances PHIL 384, focusing on such theoretical and philosophical issues as the analysis of rights or distributive justice and the institutional implications of moral forms.

Courses for Graduates

700 [210] CORE SEMINAR ON AMERICAN POLITICS (3). An overview of research on American politics that introduces students to a wide range of sustentative understandings and theoretical perspectives. Fall. MacKuen.

701 [204] AMERICAN POLITICAL INSTITUTIONS (PLCY 710) (3). Theory and practice of political institutions in the American context. Fall. Staff.

702 [280] LEGISLATIVE SYSTEMS (3). Institutions and processes in the United States Congress with some cross-national comparisons. Staff.

703 [286] CONGRESS AND THEORY BUILDING (3). This course examines diverse theoretical perspectives on national institutional change and stability, using as our institutional focus the United States Congress between 1789 and 1989. Spring. Staff.

704 [285] AMERICAN PRESIDENCY (3). Survey of the substantial literature and research on the American Presidency. Staff.

705 [253] JUDICIAL POLITICS (3). Survey of recent literature on the politics of judicial institutions and the behavior of judges, lawyers, litigants, and other actors in the judicial process, emphasizing relationships between judicial and other policy-making processes. Spring. McGuire, Unah.

706 [255] PROBLEMS IN CONSTITUTIONAL LAW (3). A survey of issues in American constitutional law, with a special emphasis on the politics of constitutional interpretation. Fall and spring. Staff.

707 [232] GOVERNMENT AND POLITICS IN METROPOLITAN AREAS (3). Changing patterns of political cooperation and conflict in metropolitan areas; political behavior in central and suburban areas; the large metropolis as a political system; and national policies toward metropolitan problems. Spring. Staff.

708 [276] SEMINAR IN SUBNATIONAL POLITICS AND POLICY (3). This course surveys the major topics and research programs in subnational American politics and policy, with special attention to the vertical and horizontal intergovernmental interactions inherent within federal political systems. Fall and spring.

709 [236] RESEARCH TOPICS IN CONTEMPORARY SOUTHERN POLITICS (3). Topics vary, but include minority politics in the region, the counter-mobilization of whites during the 1960s, party realignment and the decline of one-party politics, and the impact of the region on national politics. Fall or spring.

710 [275] POLITICAL PARTIES (3). Selected problems and issues in the study of American and comparative parties and party systems. Staff.

711 [203] AMERICAN POLITICAL BEHAVIOR (3). Theoretical study of mass behavior (i.e., participation, voting, protest) in the American context. Spring. Staff.

712 [270] PUBLIC OPINION (3). A study of public opinion, its formation, expression, and impact on political systems and public policy.

713 [271] DYNAMICS OF ELECTORAL POLITICS (3). Change within mass electorates. Topics include issue and attitude change, political realignments, and models of electoral competition. Rabinowitz.

714 [272] POLITICAL SOCIALIZATION (3). The learning process by which individuals acquire values, attitudes and norms affecting their behavior in the political community, with emphasis on major agencies of socialization: family, schools, peer groups and media. Staff.

715 [294] SEMINAR ON POLITICAL PSYCHOLOGY (3). Prerequisite, POLI 711. This course surveys and evaluates current and past research in political psychology. Topics may include: personality, attitudes and values, socialization, political reasoning, information processing, decision making, political identity and political affect. Spring. Steenbergen.

716 [216] POLITICS AND POLICY (3).

718 [205] PUBLIC POLICY ANALYSIS (PUBA 740) (3). The roles of expertise in policy discourse; the place of values in policy analysis; summarizing preferences; benefits and costs; policy models; policy expertise and democratic political systems. Fall. Staff.

719 [209] PLANNING AND GOVERNMENT (3). A survey of the nature and scope of government planning, its relation to other governmental activities, and its administrative and organizational problems. Spring. Beyle.

720 [213] MANAGING PUBLIC POLICY (PUBA 749) (3). Prerequisites, POLI 700, 745 or PUBA 723. The role(s), function(s) and strategy of public administrators in the formulation, adoption and implementation of public policies. Policy from the perspective of the policy maker; cases exploring the relationship of theories to actual policy processes. Spring. Wright.

721 [221] PUBLIC POLICY AND ADMINISTRATION (3). Alternative explanation of public policies and policy-making processes; introduction to policy analysis as a way to inform choices among policy options; policy imple-

mentation through administrative practices and procedures. Fall or spring. Gray.

722 [219] POLITICS OF THE ADMINISTRATIVE PROCESS (PUBA 722) (3). The motivations of public agency officials, interactions between bureaucracies and other political actors, and alternative strategies to control bureaucratic power and discretion in making, implementing and evaluating public policies. Fall.

724 [230] ORGANIZATION DESIGN (3). Prerequisite, POLI 700 or permission of the instructor. Field theory, motivation, communication and systems perspectives as theoretical bases for organization design. Spring. Staff.

725 [237] METHODS FOR POLICY ANALYSIS AND EVALUATION (PUBA 720) (3). Introduction to selected techniques such as the following: multiple regression, decision theory, research design, social experiments and quasi-experiments, program evaluation and policy-related models. Spring.

726 [238] INTERGOVERNMENTAL RELATIONS (PUBA 778) (3). Conflict and cooperation among governmental officials representing national, state, and local governments in the United States; changing roles of governments and new mechanisms for intergovernmental collaboration. Spring. Wright.

728 [239] POLICY WORKSHOP (3). Application of theories and techniques of policy analysis and planning to current public problems for actual clients. Focus on design and execution of policy research, and interpretation and presentation of results. Spring. Staff.

729 [295] THE PSYCHOLOGY OF COLLECTIVE POLITICS (3). Explores the psychological underpinnings of collective politics from the perspective of both individuals and groups. Political behaviors examined include deliberation, protest, nationalism and intergroup conflict. Fall. Conover.

730 [201] COMPARATIVE POLITICAL RESEARCH AND ANALYSIS (3). The seminar introduces the beginning graduate student to the central issues and major developments in the field of comparative government and politics. Fall and spring. Steiner, Searing.

731 [220] THE POLITICS OF DEVELOPMENT AND CHANGE (3). The theories, concepts and mechanisms of political change, with particular attention to processes of development and modernization in the new nations of Africa, Asia and Latin America. Hartlyn, Huber.

733 [273] COMPARATIVE POLITICAL ECONOMY (3). Examines topics in the comparative political economy of Western Europe such as neocorporatism, postindustrialism, the politics of industrial relations and the European community. Fall. Marks.

734 [292] COMPARATIVE POLITICAL BEHAVIOR (3). Political behavior of the public in cross-national or non-American settings. Political culture, belief systems, participation, protest, revolution, voting behavior, civic behavior, socialization and media. Fall and spring. Searing.

735 [231] COMPARATIVE BUREAUCRACY (3). A cross-national examination of functions, career patterns, role behavior and relationships of bureaucratic elites within the context of national political systems. Research on particular countries is emphasized. Fall. Staff.

736 [291] POLITICAL TRANSITIONS AND DEMOCRATIZATION IN COMPARATIVE PERSPECTIVE (3). Examination of contrasting theoretical approaches to understanding democracy. Comparative study of Africa, Eastern Europe and Latin America elucidates challenges and opportunities that affect possibilities for democratization and consolidation. Fall and spring. Hartlyn.

737 [293] PSYCHOLOGY OF ELITE DECISION MAKING (3). Political thinking of politicians and civil servants in domestic and foreign policy. Perception, cognition, learning, attitude change and persuasion, aging, motivation, emotions and personality. Fall and spring. Searing.

738 [252] POWER AND MORALITY IN POLITICS (3). Motives of power and morality in rational choice theories and theories of power sharing. Empirical findings and normative evaluations. Spring. Steiner.

739 [224] COMMUNIST POLITICAL SYSTEMS (3). An examination of the political evolution and process in societies governed by communist parties. Fall. Staff.

740 [227] ISSUES IN LATIN AMERICAN POLITICS (3). Explores the central issues of Latin American politics and analyzes major theoretical debates. Fall or spring. Huber, Hartlyn.

741 [228] LATIN AMERICAN POLITICS: RESEARCH AND ANALYSIS (3). Reviews major works and theoretical perspectives in the literature, assesses contemporary political science research on Latin America and examines problems of field research. Fall or spring. Hartlyn, Huber.

742 [229] POLITICAL ECONOMY OF LATIN AMERICAN DEVELOPMENT (3). Examines effects of state, regime type and political processes on agricultural and industrial policy in Latin America. Also considers the informal economy, international debt and relationship between policy and politicization. Fall and spring. Hartlyn, Huber.

743 [246] SEMINAR ON UNITED STATES-LATIN AMERICAN RELATIONS (3). Analysis of the central conceptual concerns and major theoretical approaches to the study of inter-American relations, with a focus on United States foreign policy toward the region. Spring. Schoultz.

744 [290] AFRICAN POLITICS: CHALLENGES OF DEMOCRATIZATION AND DEVELOPMENT (3). Study of the politics of development in contemporary Africa, with emphasis on changing state society relations, the roles of peasants and women in politics and prospects for democratization. Fall.

745 [211] VARIETIES OF DEMOCRATIC CAPITALISM IN EUROPE AND NORTH AMERICA (3). This course will examine the development of different types of welfare states in Europe and North America. Stephens.

750 [240] THEORIES OF INTERNATIONAL RELATIONS I (3). Introduction to the central issues and major theoretical developments in the field of international relations, focusing on system structure, political and security issues and decision making. Fall. McKeown.

751 [241] THEORIES OF INTERNATIONAL RELATIONS II (3). Introduction to the central issues and major theoretical developments in the field of international relations, focusing on the politics of international economic relations, law and organization, and fundamental system change. Spring. McKeown.

752 [243] INTERNATIONAL ORGANIZATION (3). Theories and approaches to the study of international organizations and regimes, plus selected noneconomic case studies. Staff.

753 [247] INTERNATIONAL CONFLICT AND COOPERATION (3). An examination of international conflict and cooperative processes in the context of the evolution of the international system. Spring. Staff.

754 [248] INTRODUCTION TO MATHEMATICAL INTERNATIONAL RELATIONS (3). Surveys research in mathematical models of international decision making, bargaining, systemic change, arms races, coalitions and perception. Philosophic and historical considerations about this field are also discussed.

755 [242] POWER, MORALITY AND INTERNATIONAL SOCIETY (3). Thucydides, Machiavelli, Hobbes, Kant, 20th-century Realists (Niebuhr, Morgenthau), Idealists, Neo-Realists, the British School (Wight, Bull) and selected topics (e.g., just war, human rights, food policy). Staff.

756 [245] POLITICS OF THE INTERNATIONAL ECONOMY (3). Positive theories of political choice in trade, monetary relations, foreign investment and regional integration. McKeown.

757 [223] POLITICAL ECONOMY OF THE NATION STATE IN THE WORLD SYSTEM (3). Prerequisite, ECON 460 or 465 or permission of the instructor. Analysis of the interaction between the external sector of the economy and domestic politics in weak capitalist states. Staff.

758 [257] THEORIES OF FOREIGN POLICY (3). This course is an introduction to the field of foreign policy analysis. Its primary goal is to expose

students to the theories and methods of foreign policy research and analysis. Fall and spring. Staff.

759 [250] U.S. FOREIGN POLICY (3). This course provides an overview of United States foreign policy and exposes students to the major themes and controversies in the field. Fall and spring. Staff.

760 [244] TOPICS IN NATIONAL SECURITY AND FOREIGN POLICY (3). This research seminar examines contemporary substantive issues in national security and foreign policy in light of research, organizational and administrative topics. Staff.

761 [249] SEMINAR IN PROBLEMS OF U.S. MILITARY POLICY AND CIVIL-MILITARY POLITICS (3). Research seminar in problems of United States military policy and civil-military problems, focused chiefly on deterrence, arms control and disarmament. Staff.

762 [256] SECURITY STUDIES (3). This course introduces students to the major theoretical approaches to the study of national security. Fall and spring. Staff.

768 [266] FEMINIST POLITICAL THEORY (WMST 768) (3). A survey of feminist approaches to politics and political inquiry. Fall and spring. Bickford, Conover, Leonard.

770 [310] COMMUNITY ECONOMIC DEVELOPMENT: STRATEGIES AND CHOICES (PUBA 770) (3). The goal of this course is to acquire a command of the fundamentals of economic development from the community's perspective. This is done by reading and absorbing the theoretical literature on economic development from the fields of urban politics, planning, sociology, economics, political science and sociology. Hoyman.

771 [264] MODERN POLITICAL THEORY I (3). An introduction to modern political thought, its major thinkers and issues. Fall or spring. Leonard, Lienesch, Bickford.

772 [265] MODERN POLITICAL THEORY II (3). An introduction to recent and contemporary political thought, its major thinkers and issues. Emphasis on Continental thought. Topics include post-Marx Marxism, critical theory, existentialism, structuralism, poststructuralism. Leonard.

773 [261] MAJOR ISSUES IN POLITICAL THEORY (3). An introduction to the major issues of political theory, with emphasis on the major thinkers in the history of Western political thought. Fall or spring. Leonard, Lienesch.

774 [263] CLASSICAL POLITICAL THEORY (3). An introduction to ancient and medieval political thought, its major thinkers and issues. Leonard, Lienesch, Bickford.

775 [262] AMERICAN POLITICAL THEORY (3). Survey of issues and problems in American political thought, with analysis of major thinkers and selected topics and emphasis on the role of family, society and economy in political theory. Spring. Lienesch.

777 [267] MAJOR FIGURES IN POLITICAL THEORY (3). An in-depth study of the primary and secondary literature on one or two major figures in the history of political thought (e.g., Plato, Machiavelli, Hobbes, Marx). Leonard, Lienesch, Bickford.

778 [207] THE FORMAL THEORY OF INSTITUTIONS (3). This course is a comprehensive introduction to the burgeoning literature on the formal theory of institutions.

780 [200] SCOPE AND METHODS OF POLITICAL RESEARCH (3). Permission of the instructor required. A discussion of the theory and process of political analysis, including philosophy of science, research design, the methods of drawing causal inferences, and of generating data. Stephens, Searing.

781 [206] INTERVIEWING IN SOCIAL SCIENCE RESEARCH (3). This seminar deals with the theoretical underpinnings and practical execution of interview techniques ranging from the short survey instrument to the adaptation of prolonged clinical interviews. Most of the work emphasizes different varieties of in-depth interviewing. Fall. Staff.

782 [260] LOGIC OF POLITICAL INQUIRY (3). A critical examination of models of political inquiry. Empirical (naturalist), interpretive and critical metatheories are considered in terms of each model's ontological, epistemological and practical/political consequences and presuppositions. Fall or spring. Leonard.

783 [281] STATISTICS (3). Elementary descriptive statistics and basic principles of statistical inference including estimation and tests of hypotheses. Fall. Steenbergen.

784 [282] INTERMEDIATE STATISTICS (3). This course extends the coverage of POLI 281. Topics to be covered include analysis of variance, multiple and partials correlation, and multiple regression. Spring. Steenbergen.

785 [283] INTRODUCTION TO STRUCTURAL EQUATION MODELS (3). Prerequisite, POLI 784 or equivalent. Introduces structural equation models with observed variables and econometric estimation methods. Some attention to models with unobserved variables and LISREL-type analyses. Macdonald.

786 [284] TIME SERIES ANALYSIS OF POLITICAL DATA (3). Prerequisite, POLI 784 or permission of the instructor. Discusses the problems that arise when regression methodologies are applied to time series and pooled time series data. Fall. Staff.

787 [287] MAXIMUM LIKELIHOOD METHODS (3). Prerequisites, POLI 783 and 784. Introduction to maximum likelihood estimation with applications to political science. Topics include discrete choice analysis, censored and truncated variables, event history analysis, sample selection models and multilevel inference. Spring. Steenbergen.

789 [288] GAME THEORY (3). This class provides graduate students with an introduction to game theoretic modeling, focusing on noncooperative game theory. Topics covered include normal form games, extensive-form games and games of incomplete information. Vanberg.

790 [289] POSITIVE POLITICAL THEORY (3). This seminar surveys applications of rational choice models across the subfields of political science. It also considers critiques of national choice approaches and alternative theoretical approaches to modeling human behavior.

800 [321] SEMINAR IN AMERICAN GOVERNMENT AND POLITICS (3). Fall. Beyle.

801 [353] JUDICIAL BEHAVIOR RESEARCH (3).

802 [395] RESEARCH IN PUBLIC ADMINISTRATION (PUBA 900) (Var.). Fall, spring, and summer. Staff.

803 [305] SEMINAR ON APPLICATION OF POLITICAL BEHAVIOR RESEARCH TO PUBLIC PROBLEMS (3). Exploration and examination of the ways in which political behavior research can be applied to understanding and ameliorating public problems. Beyle.

811 [311] SEMINAR IN POLITICAL SOCIOLOGY (SOCI 811) (3). The relationships between social structure and political decisions. Regimes and social structure; bureaucracies, political associations, and professions; science and politics; closed and open politics; political movements and change. Spring. Stephens.

813 [202] COMPARATIVE WELFARE STATES (SOCI 813) (3). This course examines the development, achievements, present crisis and future of welfare states in advanced industrial democracies. Fall and spring. Stephens.

816 [268] INFLUENTIAL WORKS IN DEMOCRACY (SOCI 816) (3). The course covers the major traditions of democratic theory from ancient Greece to the present, ethnographies on political organization, and 19th- and 20th-century observations on democracy. Fall. Staff.

846 [346] SEMINAR IN INTERNATIONAL COMMUNICATION (JOMC 846) (3). Prerequisite, JOMC 446 or permission of the instructor. Spring.

850 [303] THEORIES OF INTERNATIONAL POLITICS (3). Topics relating to the development of theory in the realm of international politics.

851 [302] SEMINAR IN INTERNATIONAL RELATIONS (3). Special topics in international relations, such as alliances, bargaining, decision making, economic interdependence and international human rights. Fall or spring. McKeown.

870 [361] SEMINAR IN POLITICAL THEORY (3). Special topics in political theory such as Marxism and Socialism, Democratic theory, contemporary political thought or related topics. Fall or spring. Leonard, Lienesch.

880 [300] DESIGN AND ANALYSIS OF EXPERIMENTS AND SURVEYS (3). Prerequisites, POLI 780 and 783. Introduction to the use of experimental and survey research methods in political science. Topics include factorial designs, repeated measures design, ANOVA, sampling theory, survey errors and costs, and questionnaire design. Spring. Stephens, Searing.

881 [380] TEACHING POLITICAL SCIENCE (3). The director of graduate studies assigns each teacher to a faculty supervisor, who provides advice on course design, teaching and related matters. Fall and spring.

890 [341] DIRECTED READINGS IN POLITICAL SCIENCE (Var.). Directed readings in a special field under the direction of a member of the graduate faculty. By permission only. Fall, spring and summer. Graduate faculty.

891 [342] SPECIAL TOPICS IN POLITICAL SCIENCE (1–3). Prerequisite, permission of the instructor. Seminar in selected areas of political science. Topics vary from year to year. May be repeated for credit. Fall, spring and summer. Graduate faculty.

993 [393] MASTER'S THESIS (3 or more). Fall and spring. Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall and spring. Graduate faculty.

Department of Psychology

psychology.unc.edu

DONALD T. LYSLE, *Chair*

Jonathan Abramowitz, *Associate Chair*

Professors

Donald h. Baucom (104) Couple Therapy, Individual Psychopathology and Couple Functioning, Health Concerns in a Couple/Family Context

Regina M. Carelli (187) Neurobiology of Reward, Drug Abuse, Behavioral Neurophysiology

Martha Cox (206) Family Processes and Child Social and Emotional Development; Poverty; Family and Child Transitions

Patrick J. Curran (195) Structural Equation Modeling, Longitudinal Data Analysis, High Risk Adolescent Development

Linda A. Dykstra (9) Behavioral Pharmacology, Opioid Analgesia, Drugs of Abuse

Barbara Fredrickson (229) Emotions; Positive Emotions; Social, Cognitive and Physical Effects of Pleasant Emotional States; Flourishing Mental Health

Karen M. Gil (181) Health Psychology, Chronic Illness, Stress and Coping, Pain Management, Cancer Survivorship

Peter C. Gordon (170) Psychology of Language, Cognitive Neuroscience

Bernadette Gray-Little (16) Sociocultural Influences on Personality, Marital Interaction, Psychopathology

Mark Hollins (17) Sensory and Perceptual Aspects of Pain and Touch

Andrea M. Hussong (188) Adolescent Substance Use; Models of Peer, Family and Affective Risk

Chester A. Insko (18) Attitude Change, Balance Theory, Individual-Group Discontinuity

Beth E. Kurtz-Costes (142) Development of Motivational Beliefs in Childhood and Adolescence; Family and Cultural Influences on Development

Joseph C. Lowman (24) Qualities of Exemplary College Instructors, Personality Measurement, Evolutionary Personality

Donald T. Lysle (155) Psychoneuroimmunology, Learning Theory, Comparative Animal Behavior

Robert C. MacCallum (213) Analysis and Modeling of Correlational and Longitudinal Data, Factor Analysis, Structural Equation Modeling, Multilevel Modeling

Vonnie C. McLoyd (208) Economic Context, Family Processes and Child Development; Ethnic and Cultural Influences on Parenting and Development

Peter A. Ornstein (28) Cognitive Development, Development of Learning and Memory

David L. Penn (196) Social Cognition and Social Impairment in Schizophrenia, Stigma, Cognitive-Behavior Therapy for Severe Mental Illness

Mitchell J. Picker (131) Discriminative Stimulus Properties of Drugs, Tolerance and Cross-Tolerance, Behavioral Effects of Opioid and Neuroleptic Drugs

J. Steven Reznick (192) Infant Memory and Mental Ability, Influence of Nutrition on Development, Early Detection of Autism

Lawrence Sanna (199) Social Cognition, Judgment and Decision Making

David M. Thissen (157) Psychometrics, Item Response Theory, Statistical Models for Developmental Data, Graphical Data Analysis

Associate Professors

Jonathan Abramowitz (231) Psychopathology, Prevention and Treatment of Anxiety and Related Problems, Especially Obsessive-Compulsive Disorder

Jean-Louis Gariepy (153) Development and Evolution of Social Behavior, Early Social Development in Children, Quantification of Social Networks

Joseph B. Hopfinger (198) Neural Mechanisms of Visual Attention; Electrophysiological, Neuroimaging and Eye-Tracking Studies of Attentional Control, Effects of Memory on Attention

Neil Mulligan (211) Cognitive Psychology, Human Memory, Implicit vs. Explicit Memory, Episodic Memory, Attention and Memory

Mitch Prinstein (222) Developmental Psychopathology, Interpersonal Models of Adolescent Depression and Suicide, Peer Contagion of Health Risk Behaviors

Abigail T. Panter (144) Evaluation, Measurement, Advanced Quantitative Methods, Survey Methodology, Personality, Educational Diversity in Higher Education

Todd Thiele (203) Neurobiology and Genetics of Alcoholism, Conditioned Taste Aversion Learning, Food Intake and Body Weight Regulation

Eric Youngstrom (230) Bipolar Disorder Across the Life Cycle; Emotions, Clinical Assessment, Developmental Psychopathology

Assistant Professors

Jennifer Arnold (221) Psychological Processes Underlying Language Production and Comprehension in Both Adults and Children

Daniel Bauer (224) Structural Equation Models, Multilevel Models, Mixture Models, Analysis of Change

Charlotte Boettiger (234) Cognitive Neuroscience of Addiction, Executive Function, Functional Neuroimaging, Psychopharmacology

Sy-Miin Chow (235) Dynamical Systems Modeling, State-Space Modeling, Structural Equation Models, Analysis of Change

Rita Fuchs Lokensgard (227) Biopsychological Aspects of Drug Addiction Using Preclinical Models

Kelly Giovanello (232) Cognitive Neuroscience of Human Learning and Memory; Behavioral, Neuropsychological, and Functional Neuroimaging Studies of Relational Memory

Melanie Green (225) Attitudes and Persuasion, Individual-Level Bases of Social Capital

Deborah Jones (223) Family Transmission of Mental and Physical Health in Underserved and At-Risk Families, Including Low-Income Families, Ethnic Minority Families and Families Coping with Chronic Health Issues, and the Development and Implementation of Family-Based Prevention and Intervention Programs for These Groups

Enrique Neblett (236) Racism-related stress experiences, coping, cardiovascular psychophysiology, and African American child and adolescent mental health.

Keith Payne (227) Social Cognition, Stereotyping, Prejudice, Emotions

Lorraine Taylor (204) Parenting and Parent-Child Relationships, Emotional Development, Cultural and Socioeconomic Influences on Child Development

Research Associate Professor

Susan Girdler (191) Behavioral Medicine, Women's Health

Research Assistant Professors

Stephanie J. Rowley (189) Social Personality Development and Academic Achievement (Especially with African American Children)

Clinical Professors

Ann Louise Barrick (135) Geropsychology, Behavioral Interventions in Personal Care in Dementia

Arlane Margolis (134) Psychopathology and Treatment of Adolescents and Cognitive Assessment

Gary B. Mesibov (94) Normalization and Community Programs for Handicapped People, Normal Social and Personality Development

Clinical Associate Professors

Laura Clark (179) Psychiatric and Behavioral Symptoms in Alzheimer's Disease (including MRI Correlates of Symptoms)

Stephen G. Flanagan (130) Behavior Analysis and Therapy, Schizophrenia and Other Serious Mental Disorders

Erica Wise (214) Psychotherapy with Adolescents and Adults, Legal and Ethical Issues in Clinical Psychology, Training Clinic Outcomes Research

Jennifer Yougstrom (233) Empirically Supported Treatments and Effectiveness Research with Children and Adolescents, Transporting Treatments into the Community, Assessment and Treatment of Childhood Mood Disorders, Supervision and Training

Clinical Assistant Professors

Stacie Craft (238) Treatment Effectiveness in Inpatient Children, Academic Achievement and Its Relationship to Mental Health, Child/Adolescent Resilience, Ethnic Issues

Scott Schwartz (209) Applied Clinical Research with Adolescents, Diversity Issues in Assessment and Treatment

Jennifer A. Snyder (193) Schizophrenia, Psychiatric Hospitalization, Forensic Psychology, Nonlinear Dynamic Systems Analysis

Jason Vogler (239) Biopsychosocial Rehabilitation; Clinical Psychopharmacology; Schizophrenia and SMI, CBT; Affirmative LGBT Psychotherapy

Adjunct Associate Professor

Mark E. Stanton (137) Developmental Psychobiology, Developmental Neurotoxicology, Ontogeneity of Learning and Memory Processes

Adjunct Assistant Professor

Josephine Johns (190) Comparative Animal Behavior, Substance Abuse and Aggression, Neuroendocrinology

Professors Emeriti

Elliot M. Cramer
David A. Eckerman
Samuel Fillenbaum
Edward S. Johnson
Lyle V. Jones
Richard A. King
Eugene R. Long
Barclay Martin
Paul Shinkman
Vaida D. Thompson

The Department of Psychology offers training for the doctor of philosophy degree in six areas of psychology: behavioral neuroscience, clinical, cognitive, developmental, quantitative and social. Each program is designed to acquaint students thoroughly with the theoretical and research content of a particular specialty and to train them in the research skills needed to become competent and creative investigators in their specialty area. In addition, the programs focus on the development of competence in appropriate professional skills.

While many of the requirements for a Ph.D. degree vary with the specialty program, certain requirements apply to all psychology graduate students. Each student must 1) engage in research during each year of enrollment, 2) pass a Ph.D. written examination, 3) pass a Ph.D. oral examination, 4) complete a special competency requirement (e.g., foreign language competency, teaching competency, professional competency), 5) submit an acceptable dissertation and pass a final oral examination and 6) in most cases, serve as a teaching assistant or teach a course for at least one academic year.

Additional information about graduate training in these areas may be obtained from the department's Web site, psychology.unc.edu. New students are accepted for admission in the fall semester only. Individuals seeking the M.A. degree only are not accepted.

Courses for Graduates and Advanced Undergraduates

The prerequisites for each course are provided for the general guidance of the student in consultation with an advisor. Any deviation from the required prerequisite sequence must be approved by the instructor teaching the course. Such clearance must be obtained before registering for the course.

NOTE: For undergraduates, PSYC 101 or the equivalent is prerequisite to all courses numbered above 400.

400 [101] CONDITIONING AND LEARNING (NBIO 400) (3). Prerequisites, PSYC 101 and 222. A comprehensive survey of the methods, findings and theories of classical and operant conditioning. Skills necessary to evaluate, integrate and summarize significant original literature will be developed. Staff.

401 [102] BIOLOGICAL FOUNDATIONS OF BEHAVIOR (NBIO 401) (3). Prerequisites, PSYC 101 and 222 or BIOL 101. Ethological, genetic and physiological variables will be studied in relation to their behavioral effects. Gariepy, Lysle.

402 [106] PHYSIOLOGICAL PSYCHOLOGY (NBIO 402) (3). Prerequisites, PSYC 101 and 220. Elements of neurophysiology, neuroanatomy and neurochemistry as they apply to the understanding of brain-behavior relationships. Carelli.

403 [107] PHYSIOLOGICAL PSYCHOLOGY LABORATORY (3). Prerequisites, PSYC 101 and 220 or 402. "Hands on" laboratory course designed to introduce students to experimental protocols emphasizing "brain-behavior" relationships. Topics include gross neuroanatomy, stereotaxic surgery and the effects of drugs on behavior. Carelli, staff.

404 [124] PSYCHOLOGICAL APPLICATIONS OF DRUGS (3). Prerequisite, PSYC 101. This course will investigate the pharmacological effects and the clinical efficacy of drugs used to treat behavior disorders. Picker.

425 [121] ADVANCED PERCEPTUAL PROCESSES (3). Prerequisites, PSYC 101 and 220, 225 or 230. The perception of objects and events; the role of cognitive factors in perception. Staff.

430 [122] HUMAN MEMORY (3). Prerequisites, PSYC 101 and 222 or 230. Theoretical and applied issues in human memory. Bayen.

431 [123] INTRODUCTION TO COGNITIVE SCIENCE (3). Prerequisites, PSYC 101 and 210 or equivalent. An introduction to the interdisciplinary study of the mind, intelligent behavior, information processing and communication in living organisms and computers. Hartman.

432 [125] PSYCHOLOGY OF LANGUAGE (3). Prerequisites, PSYC 101 and 230 or LING 101 and 400. After an examination of the possible relations between psychology and linguistics, this course will consider problems in the acquisition of language and particular recent work in experimental psycholin-

guistics. Gordon.

433 [135] BEHAVIORAL DECISION THEORY (3). Prerequisite, PSYC 101. Simple mathematical and psychological models of judgment and choice, and related experiments, are treated, as are applications to real-world problems in medical, environmental, policy, business and related domains. Staff.

434 COGNITIVE NEUROSCIENCE (3). Prerequisites, PSYC 101 and 210; one of PSYC 220, 222, 225 or 230, or BIOL 450 or 455. Introduction to cognitive neuroscience. Higher mental processes including attention, memory, language and consciousness will be covered, with an emphasis on the neural mechanisms that form the substrates of human cognition. Gordon, Hartman, Hopfinger.

435 [100] TOPICS IN COGNITION (3). Prerequisites, PSYC 101 and one of PSYC 220, 222, 225 or 230. Examines selected topics in cognitive psychology, examining issues related to thinking, memory, consciousness, language or higher-level perception. The selected topics can vary from semester to semester. Johnson, Gordon.

460 [126] HUMAN INFANCY (3). Prerequisites, PSYC 101 and 250. The primary focus of this course is the psychological development of human infants but other perspectives are considered: philosophy, parenting, health and public policy, the law. Reznick.

461 [127] COGNITIVE DEVELOPMENT (3). Prerequisites, PSYC 101 and 250. An examination of the development of attention, perception, learning, memory and thinking in normal children. Kurtz-Costes.

462 [128] DEVELOPMENT OF LANGUAGE (3). Prerequisites, PSYC 101 and 250. Study of the development of language in normal children. Staff.

463 [129] DEVELOPMENT OF SOCIAL BEHAVIOR AND PERSONALITY (3). Prerequisites, PSYC 101, 210 and 250. Developmental processes during early childhood as these relate to social behavior and personality. Gariepy, staff.

464 [131] PERSPECTIVES ON NONPARENTAL CHILD CARE (3). Prerequisites, PSYC 101 and 250. Explores the history, politics and practice of nonparental child care through readings, lectures and a semester-long internship in a child care center. Reznick, staff.

465 [165] POVERTY AND DEVELOPMENT (3). Prerequisites, PSYC 101 and 250. Poverty is one of the most consistent and influential risk factors for problematic development. This course focuses on the scientific study of how poverty affects development across the human life span. Taylor.

466 [170] RESEARCH IN DEVELOPMENTAL PSYCHOLOGY (3). Prerequisites, PSYC 101, 210 and 250. Introduction to the issues, methods and outcomes of research in developmental psychology. Demonstrational projects designed and completed. One lecture hour and four laboratory hours per week. Staff.

467 [171] THE DEVELOPMENT OF BLACK CHILDREN (3). Prerequisites, PSYC 101 and 250; PSYC 210 recommended. A survey of the literature on the development of black children. Topics include peer and social relations, self-esteem, identity development, cognitive development, school achievement, parenting, family management and neighborhood influences. McLoyd, Taylor.

468 [172] FAMILY AS A CONTEXT FOR DEVELOPMENT (3). Prerequisites, PSYC 101, 210 and 250. Explores how the family influences children's development. Topics include genetics, family structure (e.g., single parents, working mothers, divorce, number of siblings), discipline, parental values and beliefs, ethnic diversity. Cox, Jordan, Kurtz-Costes.

469 [162] EVOLUTION AND DEVELOPMENT OF BIOBEHAVIORAL SYSTEMS (3). Prerequisites, BIOL 101 and PSYC 101, 210 or 215. Examines the evolution and development of behavior patterns and their physiological substrates. Staff.

470 DEVELOPMENTAL RESEARCH ON THE FAMILY (3). Prerequisites, PSYC 210 and 250. Child and adolescent development within the context of family is examined. Course topics include family theory, cognitive development, divorce, poverty and gender. Each student will complete a research project.

499 [104] CURRENT TOPICS IN PSYCHOLOGY (3). Permission of the instructor. Various special areas of psychological study, offered as needed. Course may be repeated for credit.

500 [144] PSYCHOLOGICAL DISORDERS OF CHILDHOOD AND ADOLESCENCE (3). Prerequisites, PSYC 101, 245 and 250. A survey of theories bearing on atypical development and disordered behavior, and an examination of major child and adolescent behavior problems and clinical syndromes. Hussong, Margolis.

501 [140] ADVANCED PERSONALITY (3). Prerequisites, PSYC 101 and 240. An in-depth analysis of major theoretical issues in personality study. Gray-Little, Lowman.

502 [141] PSYCHOLOGY OF ADULTHOOD AND AGING (3). Prerequisites, PSYC 101 and 250. A developmental approach to the study of adulthood, from young adulthood through death. Topics include adult issues in personality, family dynamics, work, leisure and retirement, biological and intellectual aspects of aging, dying and bereavement. Barrick or staff.

503 [142] PSYCHOLOGY OF BLACK AMERICANS (3). Prerequisites, PSYC 101 and 240. This course will focus upon the personal characteristics of black Americans as these have been studied by psychologists and other behavioral scientists. Various methodological approaches will be considered. Gray-Little

504 [145] HEALTH PSYCHOLOGY (3). Prerequisites, PSYC 101 and 245. An in-depth coverage of the theoretical issues and clinical manifestations of psychological responses characteristic of individuals with chronic physical disorders. Gil, Koo-Loeb.

505 [147] INTRODUCTION TO CLINICAL PSYCHOLOGY (3). Prerequisites, PSYC 101, 210 and 245. Overview of clinical psychology: history, scientific basis and major activities and concerns including assessment, psychotherapy and other psychological interventions, community psychology, ethics and professional practice. Staff.

506 [152] ATYPICAL PERSONALITIES AND GROUPS I (3). Prerequisites, PSYC 101 and 245. Addresses methods to assess, treat and rehabilitate adults or elderly with serious mental disorders. Includes volunteering in a mental health agency serving people with schizophrenia, psychosis or dementia. Barrick, Flanagan.

507 [160] AUTISM (3). Prerequisites, PSYC 101, 245 and 250. Intensive service-learning seminar on autism includes a supervised community placement. Topics include historical diagnostic issues, etiological theories, assessing patterns of functioning, developmental/life span issues, family concerns and intervention approaches. Staff.

508 [146] BEHAVIOR AND THE BRAIN: INTRODUCTION TO NEUROPSYCHOLOGY (3). Prerequisites, PSYC 101 and 220 or 230. Introduction to brain-behavior relationships through the study of the effects of brain damage. Focus on cognitive and emotional processes in humans as they are affected by disease and trauma to the brain. Hartman.

509 [109] APPLIED BEHAVIORAL ANALYSIS (3). Prerequisites, PSYC 101, 222 and 245. A survey of applications of learning theory in solving clinical, educational and societal problems. Practicum experience included. Staff.

510 [149] OBSERVATIONAL METHODS (3). Prerequisites, PSYC 101 and 210. Design, use and evaluation of observational methods for research and clinical purposes. Staff.

511 [150] STRESS AND COPING IN CHILDREN AND ADOLESCENTS (3). Prerequisites, PSYC 101 and 250. Examines issues related to the role of risk and protective factors in the development of psychopathology in children and adolescents. The course includes practicum experience with youth. Staff.

512 [155] POPULARITY, FRIENDSHIP AND PEER RELATIONS (3). Prerequisite, PSYC 101. This course will review literature regarding peer relations among children and adolescents, including peer acceptance/rejection, popularity, bases of friendship selection, peer crowds, romantic relationships and theories of

peer influence. Prinstein.

513 ADVANCED SEMINAR ON THE ANXIETY DISORDERS (3). Prerequisite, PSYC 245. This course will explore the nature and treatment of normal and abnormal anxiety. Students will learn about the psychopathology, assessment and treatment of the various anxiety disorders.

530 [130] DESIGN AND INTERPRETATION OF PSYCHOLOGICAL RESEARCH (3). Prerequisites, PSYC 101 and 270. Emphasis on the methodological principles underlying experimental and correlational research. Interaction of theory and practice in the design and interpretation of psychological studies. Staff.

531 [148] TESTS AND MEASUREMENT (3). Prerequisites, PSYC 101 and 210. Basic psychometric theory underlying test construction and utilization. Detailed study of issues and instruments used in assessing intellectual functioning, educational progress, personality and personnel selection. Staff.

560 [184] SELF AND SOCIETY (3). Prerequisites, PSYC 101, 210 and 260; PSYC 270 desirable, but not required. Content, structure and functions of the self-concept. How the self-concept is shaped by society and developmental processes; ways in which the self-concept affects perception of others; self-esteem. Class participation and presentations required. Staff.

561 [185] SOCIAL COGNITION (3). Prerequisites, PSYC 101, 210 and 260. Theory and research in social psychology, which explores the cognitive processes underlying social phenomena. Specific topics covered include attributions, emotions, automaticity, heuristics, self, goals, stereotyping, expectancies, social motives and others. Staff.

562 [187] APPLIED SOCIAL PSYCHOLOGY (3). Prerequisites, PSYC 101, 210 and 260. Applications of social psychological theory/research to practical social problems and issues, e.g., organizational behavior-job satisfaction, effects of advertising and media on behavior and discrimination-affirmative action. Staff.

563 [188] SMALL GROUPS (3). Prerequisites, PSYC 101, 210 and 260. Intensive survey of research and theory on behavior in small groups combined with appropriate experience in studying various structured groups. Sanna.

564 [189] INTERPERSONAL PROCESSES (3). Prerequisites, PSYC 101, 210 and 260. Intensive coverage of normal interpersonal processes, focusing on the dyad. Staff.

565 [190] STEREOTYPING, PREJUDICE AND DISCRIMINATION (3). Prerequisites, PSYC 101, 210 and 260; PSYC 270 desirable, but not required. Examines the determinants, functions, processes and consequences of stereotyping, prejudice and discrimination. Prospects for change are considered. Class presentations and participation required. Payne.

566 [191] ATTITUDE CHANGE (3). Prerequisites, PSYC 101, 210 and 260. A detailed consideration of the theoretical issues in attitude and belief change. Staff.

567 RESEARCH IN POSITIVE PSYCHOLOGY (3). Prerequisites, psychology major; PSYC 101, 201 or 215, and 270. This advanced course in positive psychology is research intensive and intended as a capstone for majors in psychology.

600 [112] HISTORICAL TRENDS IN PSYCHOLOGY (3). Prerequisite, PSYC 101. Limited to senior majors or to graduate students in psychology; others by permission of the instructor. Overview of the origins of psychological concepts, movements and fields of study. Staff.

601 [180] PSYCHOLOGY AND LAW (3). Prerequisite, PSYC 101 and 270. Examines the legal system from the perspective of psychology methods and research, with a focus on criminal law. Discusses dilemmas within the law and between the legal system and psychology. Mulligan, Snyder.

602 [163] EVOLUTIONARY PSYCHOLOGY (3). Prerequisite, PSYC 101. Major topics of general psychology are examined from an evolutionary perspective with an emphasis on empirical studies asking why much current human behavior and experience would have been adaptive for our early ancestors. Lowman.

Courses for Graduates

701 [201] BEHAVIOR AND ITS BIOLOGICAL BASES I (NBIO 701A) (3). A survey of psychological and biological approaches to the study of sensory and perceptual information processing, with an emphasis on touch and pain. Fall. Staff.

702 [202] BEHAVIOR AND ITS BIOLOGICAL BASES II (NBIO 702A) (3). A survey of psychological and biological approaches to the study of basic learning and higher integrative processing. Spring. Staff.

703 [204] ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (NBIO 703) (3). Prerequisite, PSYC 402 or equivalent. Each fall one special topic will be covered in depth (e.g., neural bases of memory storage, homeostasis and perception). Format includes lectures and seminar meetings with student presentations. Fall. Staff.

704 [207] APPLICATIONS OF EXPERIMENTAL PSYCHOLOGY TO HEALTH RESEARCH (NBIO 704) (3). This course provides a critical analysis of interdisciplinary research within experimental psychology, including such topics as psychopharmacology, psychoneuroimmunology, psychophysiology and animal models of brain/behavior disorders. Fall. Carelli, Dykstra, Girdler, Light, Lysle, Picker.

705 [323] BEHAVIORAL PHARMACOLOGY (NBIO 705, PHCO 705) (3). Prerequisite, PSYC 404 or permission of the instructor. Basic principles of pharmacology and behavior analysis are considered in relation to drugs that affect the central nervous system. Spring. Dykstra.

707 [324] CLINICAL PSYCHOPHARMACOLOGY (3). Examinations of the clinical efficacy, side effects and neuropharmacological actions of drugs used in the treatment of behavioral disorders. Additional topics include the behavioral and neuropharmacological actions of drugs of abuse. Spring. Picker.

708 [302] SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (NBIO 708) (3). Prerequisite, permission of the instructor. Limited to graduate students in psychology and neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. Fall and spring. Carelli.

709 [325] SEMINAR IN THEORETICAL-EXPERIMENTAL PSYCHOLOGY (1–3). As announced. Staff.

719 [321] SEMINAR IN EXPERIMENTAL HEALTH PSYCHOLOGY (3). An in-depth treatment of research topics in behavioral and biological aspects of health psychology. Fall and spring. Lysle, Light.

720 [333] RESEARCH SEMINAR IN EXPERIMENTAL PSYCHOLOGY (3). Prerequisite, graduate standing in psychology. Students design and conduct a supervised research project and engage in critical discussion of research performed by other students and faculty. Fall and spring. Lysle.

721 [334] RESEARCH SEMINAR IN EXPERIMENTAL PSYCHOLOGY (3). Prerequisite, graduate standing in psychology. Students design and conduct a supervised research project and engage in critical discussion of research performed by other students and faculty. Fall and spring. Lysle.

740 [336] SEMINAR IN COGNITIVE PSYCHOLOGY (1–3). Prerequisite, permission of the instructor. Discussion and critical evaluation of various theories of thinking; theories of concept formation, problem solving and reasoning. As announced. Staff.

750 [337] RESEARCH SEMINAR IN COGNITIVE PSYCHOLOGY (3). Prerequisite, graduate standing in psychology. Students conduct a supervised research project in cognitive psychology, and participate in discussion of current research and related ethical and methodological issues. Fall and spring. Staff.

751 [338] RESEARCH SEMINAR IN COGNITIVE PSYCHOLOGY (3). Prerequisite, graduate standing in psychology. Students conduct a supervised research project in cognitive psychology, and participate in discussion of current research and related ethical and methodological issues. Fall and spring. Staff.

760 [274] ADVANCED COGNITIVE DEVELOPMENT (3). This course

covers the development of attention, perception, learning, memory, thinking and language, beginning in infancy and covering the life span from both information processing and Baldwin-Piaget approaches. Spring. Ornstein, Kurtz-Costes.

761 [273] ADVANCED SOCIAL DEVELOPMENT (3). Current thinking and research relevant to social, emotional and personality development across the life span. Topics include parent-child interaction, peer relations, aggression, competence, sex roles and gender differences. Fall. Gariepy.

762 [216] DEVELOPMENTAL PSYCHOLOGY: METHODOLOGY I (3). Philosophical and sociological perspectives on research in developmental psychology, with specific applications to ongoing projects. As announced. Staff.

763 [217] DEVELOPMENTAL PSYCHOLOGY: METHODOLOGY II (3). Techniques and research designs appropriate for the study of the development of behavior. Supervised experience in the planning of experiments and data analysis. As announced. Staff.

764 [275] DEVELOPMENTAL ASSESSMENT (3). Introduction to instruments used for the assessment of development and cognition in infants, preschoolers and school-aged children, with primary focus on research issues. Practice administration of instruments in field settings. Spring. Staff.

765 [278] DEVELOPMENTAL PSYCHOLOGY: HISTORY AND THEORY (3). Drawing upon materials presented in the previous content and method courses, this class examines in-depth various types of developmental theories. As announced. Staff.

766 [286] DEVELOPMENTAL PSYCHOBIOLOGY (3). Provides an introduction to psychobiological research, focusing on early development in animals. Topics include embryology, developmental neurobiology, the development of sensory and communication systems and social behavior. As announced. Gariepy.

767 [279] ADVANCED FAMILY THEORY AND RESEARCH (3). Research related to family processes, especially regarding the developmental consequences of varying family environments on children. Topics include divorce, cognitive development, single parents, parental employment, discipline, cultural context. As announced. Cox, Kurtz-Costes.

768 [306] SEMINAR IN DEVELOPMENTAL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Intensive study of selected topics in developmental psychology. As announced. Staff.

780 [276] DEVELOPMENTAL PSYCHOLOGY FORUM. Prerequisite, permission of the instructor. Presentations of research by faculty, students and visitors; discussion of professional topics.

781 [308] PROSEMINAR IN DEVELOPMENTAL SCIENCE (3). Prerequisite, permission of the instructor. Intensive study of selected topics in human development that are being explored by members of the Carolina Consortium on Human Development staff. Fall and spring. Staff.

790 [210] HISTORY OF PSYCHOLOGY (3). Review of the history of major areas of psychology, with special emphasis on the conceptual and methodological underpinnings of the discipline. Fall. Gariepy.

791 [300] SPECIAL READINGS IN PSYCHOLOGY (3). Prerequisite, permission of the instructor. Intended for advanced graduate students. Fall and spring. Staff.

792 [331] PROFESSIONAL PROBLEMS IN PSYCHOLOGY (1). Prerequisite, permission of the instructor. Consideration of problems facing academic psychologists. Fall. Staff.

793 [332] LABORATORY IN COLLEGE TEACHING (3). Specific training in presentational and interpersonal skills needed by college teachers, such as planning, lecturing, discussing, motivating and evaluating. Fall. Lowman.

803 [242] EMPIRICALLY VALIDATED APPROACHES TO CHILD AND FAMILY PSYCHOTHERAPY (3). Prerequisite, graduate status in clinical psychology. This course covers the research bases and clinical application of psychotherapeutic interventions that have demonstrated empirical validity for assisting children and families. Fall. Staff.

804 [243] EMPIRICALLY VALIDATED APPROACHES TO ADULT PSYCHOTHERAPY (3). Prerequisite, graduate status in clinical psychology. This course covers the research bases and clinical application of psychotherapeutic interventions that have demonstrated empirical validity for assisting adult clients. Fall. Staff.

805 [220] PERSONALITY: THEORY AND RESEARCH (3). Prerequisite, permission of the instructor. Review and critical analysis of major theoretical and empirical approaches to the study of personality. Fall. Staff.

806 [256] CLINICAL RESEARCH METHODS (3). Prerequisite, graduate status in clinical psychology. Analysis of clinical and personality research in terms of their contribution to knowledge, their limitations, possibilities for their improvement, further research they suggest, etc. Preparation of individual research proposals for class presentation and critical evaluation. Three hours a week. Fall. Staff.

807 [259] CLINICAL RESEARCH SEMINAR (2). Prerequisite, graduate status in clinical psychology, PSYC 256. Designing and presenting research proposals in individual students' research areas in oral and written form. Critiquing research proposals. Research ethics and preparing and evaluating protocols for ethical review. Spring. Staff.

809 [244] ADULT PSYCHOPATHOLOGY (3). Prerequisite, first-year graduate status in clinical psychology. The major forms of psychopathology are examined within a development framework. Fall and spring. Gray-Little, Hussong.

810 [245] DEVELOPMENTAL PSYCHOPATHOLOGY (3). Prerequisite, first-year graduate status in clinical psychology. The major forms of psychopathology are examined within a development framework. Fall and spring. Gray-Little, Hussong.

811 [254] ADULT PRACTICUM (3). Prerequisite, second-year graduate status in clinical psychology. Supervised experience in psychological assessment and psychotherapy. Six to eight laboratory hours a week. Fall and spring. Staff.

812 [255] CHILD AND ADOLESCENT PRACTICUM (3). Prerequisite, second-year graduate status in clinical psychology. Supervised experience in psychological assessment and psychotherapy. Six to eight laboratory hours a week. Fall and spring. Staff.

813 [250] ADVANCED ADULT ASSESSMENT (3). Prerequisite, graduate standing in clinical psychology. Consideration of how various forms of assessment data can be utilized in understanding the structure and dynamics of adult personalities; problems of differential diagnosis, brain damage, etc., are also considered. Two lecture and two laboratory hours a week. Fall. Baucom.

814 [251] ADVANCED CHILD ASSESSMENT (3). Prerequisite, PSYC 808. Theory, research and application of objective and projective techniques for behavioral, emotional, psychiatric, interpersonal and social cognitive assessment of children and adolescents. Two lecture and two laboratory hours a week. Spring. Staff.

815 [247] ETHICS AND PRACTICE IN CLINICAL PSYCHOLOGY (1). Prerequisite, graduate standing in clinical psychology. A survey and discussion of the ethical and legal issues that clinical psychologists confront in a variety of professional settings. Fall. Staff.

816 [264] ADVANCED CLINICAL PRACTICUM AND PROFESSIONAL ETHICS (3). Prerequisites, PSYC 254 and 255. Supervised clinical work in an area of particular interest to the student. Clinical activity is coordinated with reading and discussion of literature or professional ethics. Fall and spring. Staff.

817 [265] ADVANCED ADULT PRACTICUM AND PROFESSIONAL ETHICS (3). Prerequisites, PSYC 254 and 255. Supervised clinical work in an area of particular interest to the student. Clinical activity is coordinated with reading and discussion of literature or professional ethics. Fall and spring. Staff.

818 [266] ADVANCED CHILD/ADOLESCENT PRACTICUM AND PROFESSIONAL ETHICS (1–3; can be repeated). Prerequisite, PSYC 817.

Individualized clinical practicum for advanced doctoral students in clinical psychology. Supervised experience in psychotherapy, psychological assessment and consultation. Fall and spring. Baucom.

822 [326] SEMINAR IN CLINICAL PSYCHOLOGY (1–3). As announced. Staff.

825 [267] ADVANCED CLINICAL PRACTICUM (1–3; can be repeated). Prerequisite, PSYC 817. Individualized clinical practicum for advanced doctoral students in clinical psychology. Supervised experience in psychotherapy, psychological assessment and consultation. Fall and spring. Baucom.

830 [281] STATISTICAL METHODS IN PSYCHOLOGY I (4). Prerequisite, a course in introductory statistics. Data analysis, sampling, applied probability, elementary distribution theory, principles of statistical inference. Fall. Staff.

831 [282] STATISTICAL METHODS IN PSYCHOLOGY II (4). Prerequisite, PSYC 830. Statistical estimation and hypothesis testing for linear models (ANOVA, ANCOVA, regression analysis); statistical models in the design and analysis of experiments. Spring. Staff.

840 [285] COMPUTATIONAL STATISTICS (3). Prerequisite, PSYC 831 or permission of the instructor. Current computational environments for data analysis and visualization are taught and used as a basis for understanding current (and creating new) methods of computational statistics and dynamic statistical graphics. Fall. Staff.

841 [283] INTRODUCTION TO MULTIVARIATE TECHNIQUES FOR THE BEHAVIORAL SCIENCES (3). Prerequisite, PSYC 831 or permission of the instructor. An introduction to linear regression and multivariate statistical techniques as employed in the behavioral sciences, with particular emphasis on analytic techniques and interpretation of results. As announced. Staff.

842 [232] TEST THEORY AND ANALYSIS (3). Prerequisite, PSYC 831. Survey of classical test theory and more recent developments in item analysis and test construction. As announced. Staff.

843 [236] FACTOR ANALYSIS (3). Prerequisite, PSYC 831 or permission of the instructor. Advanced topics in factor analytic models, multivariate correlational models and analysis of covariance structures as applied in behavioral research. As announced. Panter.

844 [231] STRUCTURAL EQUATION MODELS WITH LATENT VARIABLES (3). Prerequisite, PSYC 831 or permission of the instructor. Examination of a wide range of topics in covariance structure models, including their history, underlying theory, controversies and practical use with major computer packages. As announced. Panter.

850 [280] QUANTITATIVE PSYCHOLOGY FORUM (1). Presentations of research by faculty, students and visitors; discussion of professional topics such as ethics, the publication process, research funding and the reviewing of articles. Fall and spring. MacCallum, Thissen, Curran, Panter.

851 [230] MULTIDIMENSIONAL SCALING (3). Prerequisites, PSYC 831 and 854, or equivalent. Survey, with application to dissimilarity data, of the algebraic, geometric and computational bases of multidimensional scaling methods, with emphasis on individual differences models and nonlinear transformation. Alternate years. Staff.

852 [234] MATHEMATICAL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Development and applications of mathematical models in theoretical and experimental psychology. Topics selected from learning, memory, perception, thinking, attention, decision making. As announced. Staff.

853 [237] ANALYSIS OF FREQUENCY TABLES IN BEHAVIORAL RESEARCH (3). Prerequisite, PSYC 831 or permission of the instructor. An introduction to the analysis of frequency data (including measures of association) and the use of log-linear models and logit models in the behavioral sciences. Alternate years. Staff.

854 [284] QUANTITATIVE RESEARCH SYNTHESIS (META-ANALYSIS) (3). Prerequisite, PSYC 831 or permission of the instructor. Survey of research synthesis including history, problem formulation, statistical concerns, describing and combining studies, combining p-values, testing for heterogeneity, accounting for moderator variables, fixed, mixed, and random effects models, publication bias. Alternate years. Staff.

859 [330] SEMINAR IN QUANTITATIVE PSYCHOLOGY (1–3). As announced. Staff.

860 [223] DIRECTED RESEARCH SEMINAR IN SOCIAL PSYCHOLOGY (3). Prerequisite, first-year social psychology graduate student or permission of the instructor. Directed research problems and seminar discussion of related issues. Fall and spring. Staff.

861 [224] DIRECTED RESEARCH SEMINAR IN SOCIAL PSYCHOLOGY (3). Prerequisite, first-year social psychology graduate student or permission of the instructor. Directed research problems and seminar discussion of related issues. Fall and spring. Staff.

862 [228] ADVANCED SOCIAL PSYCHOLOGY (3). Prerequisite, PSYC 867 or permission of the instructor. Intensive study of interdependence theory and research of interpersonal relationships. Spring. Staff.

863 [233] METHODS OF SOCIAL PSYCHOLOGY (3). Prerequisite, PSYC 867 or permission of the instructor. Methods of investigation in social psychology, with primary emphasis upon experimental design and the nature of the experimental situation. Fall. Insko, staff.

864 [235] TOPICS IN ATTITUDE RESEARCH (3). Prerequisite, PSYC 867 or permission of the instructor. A critical examination of selected topics in attitude theory and change. Spring. Insko, staff.

865 [258] METHODS OF APPLIED SOCIAL PSYCHOLOGY (3). Prerequisite, graduate standing. Supervised research experience in an applied setting and accompanying methods of non-laboratory research, including nonquantitative methods of social psychology and evaluation of quasi-experimental and non-experimental designs. Spring. Staff.

866 [225] INTERPERSONAL PROCESSES AND CLOSE RELATIONSHIPS (3). Prerequisite, PSYC 238 or permission of the instructor. Intensive study of the processes by which adult close relationships are initiated and developed. Fall or spring. Staff.

867 [238] ADVANCED SURVEY OF SOCIAL PSYCHOLOGY (3). Prerequisite, graduate standing or permission of the instructor. Survey of research and theories of attitude change, interpersonal relations and small groups. Fall. Staff.

868 [328] SEMINAR IN SOCIAL PSYCHOLOGY (3). Prerequisite, PSYC 867 or permission of the instructor. Fall or spring. Staff.

869 [252] ADVANCED SOCIAL COGNITION (3). Prerequisite, PSYC 867 or permission of the instructor. Advanced theory and research in social psychology that explores the cognitive processes underlying social phenomena. Specific topics include attributions, emotions, heuristics, self, goals, motives and others. Spring. Sanna, staff.

904I [604] AGING AND HEALTH (DENT 604, DPET 604I, EPID 620I, HMSC 904I, MEDI 604, NURS 782I, PHYT 904I, SOCI 824, SOWO 604I) (3).

907 [607] AGING AND PUBLIC POLICY (DENT 607, DPET 607I, FMME 607, HMSC 951I, HPAA 961, MEDI 607, NURS 783I, SOWO 607I) (3).

991 [341] ADVANCED RESEARCH (3). Six laboratory hours a week. Fall and spring. Staff.

993 [393] MASTER'S THESIS (3 or more). Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Gillings School of Global Public Health

www.sph.unc.edu
BARBARA K. RIMER, *Dean*
Peggy Leatt, *Associate Dean of Academic Affairs*
Felicia Mebane, *Assistant Dean for Students*

The Gillings School of Global Public Health provides exceptional teaching, conducts ground-breaking research and delivers dedicated service to people across North Carolina, the United States and around the world. Ranked the top public school of public health by *U.S. News and World Report* in 2007, the school's mission is to improve public health, promote individual well-being and eliminate health disparities.

The school, accredited by the Council on Education for Public Health, offers undergraduate and graduate programs on our campus located near UNC's schools of Medicine, Nursing, Dentistry and Pharmacy, and through our state-of-the-art distance-education programs. Our new research center and our many renovated labs and classrooms provide an environment highly conducive to the learning and creation of public health knowledge.

Beyond campus, we teach, conduct research and serve communities across our state and nation and around the world. Our Office of Global Health organizes the school's global health activities. The school's service and outreach arm, the North Carolina Institute for Public Health, brings public health scholarship and practice communities together. Carolina Public Health Solutions, our newest initiative funded by the Gillings Gift, enables us to anticipate new public health challenges, quickly find solutions and accelerate the delivery of best practices to improve people's lives.

To learn more about the field of public health, visit www.whatispublichealth.org. Developed by the Association of Schools of Public Health, the site describes public health, its effect on our lives and the variety of public health careers.

Departments and curricula in the Gillings School of Global Public Health are:

- Biostatistics*
- Environmental Sciences and Engineering*
- Epidemiology
- Health Behavior and Health Education
- Health Policy and Administration*
- Maternal and Child Health
- Nutrition*
- Public Health Leadership Program

All departments have graduate degree programs and four (*) offer degrees for undergraduates.

Interdisciplinary programs that provide additional opportunities for students in public health-related education, service, and research include: the Carolina Population Center, the Cecil G. Sheps Center for Health Services Research, the Center for Environmental Health and Susceptibility, the Center for Health Promotion and Disease Prevention, the Clinical Nutrition Research Center, the Injury Prevention Research Center, the Lineberger Comprehensive Cancer Center, the North Carolina Institute for Public Health, the North Carolina Occupational Safety and Health Education Resource Center, and the North Carolina Center for Public Health Preparedness.

Graduate academic degrees offered by the School of Global Public Health are the master of science (M.S.) and the doctor of philosophy (Ph.D.), and the graduate professional degrees are the master of science in public health (M.S.P.H.), the master of science in environmental engineering (M.S.E.E.), the master of public health (M.P.H.), the master of health care administration (M.H.A.) and the doctor of public health (Dr.P.H). All requirements for these degrees are administered by the faculty of the School of Global Public Health with the approval of the Administrative Board of The Graduate School.

M.P.H. Degree

The master of public health degree is designed to prepare students for positions that require a considerable breadth of knowledge of the field of public health and a lesser degree of specialization in one area. Students in this degree program may take nearly half of their courses outside of the major department or curriculum and undergo extensive field training (if previous experience is not deemed sufficient by criteria set by the student's department or curriculum). Typically, master of public health students already have acquired education in a health or health-related profession, or have at least three years of experience in a field related to public health. The master of public health degree is often a terminal degree, and qualified students may proceed in the School of Global Public Health to a Dr.P.H. or Ph.D. program for further study.

M.S.P.H. Degree

The master of science in public health degree is designed to prepare students for professional careers in specialized areas of public health and health policy. Students in this degree program typically take courses primarily in one major department or curriculum of the School of Global Public Health. Core requirements provide for orientation to a broader view of public health. The master of science in public health degree is usually a terminal degree; however, students may use this degree or the master of science degree (more so than the master of public health) as a precursor to a doctoral program. Programs of study leading to the M.S.P.H. degree are offered by the following departments: Environmental Sciences and Engineering, Health Policy and Administration, and Maternal and Child Health.

M.H.A. Degree

The master of health care administration degree in the Department of Health Policy and Administration is designed to prepare students for management careers in healthcare organizations. Graduates will be prepared to take positions as staff, management or consultants for hospitals, health maintenance organizations, clinics, public health departments and other health care settings. Courses focusing on health care services are supplemented with core courses offering a broader view of public health.

M.S. Degree

The master of science degree is offered in the departments of Biostatistics, Environmental Sciences and Engineering, Nutrition, and in the Public Health Leadership program.

M.S.E.E. Degree

The curriculum leading to the M.S.E.E. degree is designed to prepare graduates for careers in the environmental engineering profession with special emphasis on water resources and air and industrial hygiene. Specifically, students awarded this degree are prepared for professional work with private firms of consulting engineers, with public agencies at the national, state, regional and local levels of government and with a

variety of industrial organizations.

Dr.P.H. Degree

The doctor of public health degree provides professional training to prepare students to effectively conduct or supervise research, usually of an applied nature. Graduates are also prepared to integrate new knowledge and techniques into community and/or public health practice. Graduates are typically employed by operating community or public health programs at the local, state, national or international levels. Programs of study leading to the Dr.P.H. degree are offered by the following departments: Biostatistics, Health Policy and Administration (distance learning format), Maternal and Child Health and Nutrition.

Ph.D. Degree

The doctor of philosophy degree prepares students for leadership in academic and related settings involving teaching and research. Students learn how to develop and apply theories for understanding public health, health care services and policy. Graduates are typically employed by universities or other organizations conducting research. This degree is offered in the departments of Biostatistics, Environmental Sciences and Engineering, Epidemiology, Health Behavior and Health Education, Health Policy and Administration, Maternal and Child Health and Nutrition. The precursor to the Ph.D. degree is typically (although not exclusively) an MS.P.H. degree, if the research is oriented to public health, or an M.S. degree.

Dual Degree Programs

A number of dual degree programs are offered in select departments of the School of Public Health. Under the dual degree arrangement, a student may earn two professional degrees in a period of time less than the total required by the two degrees separately. Medical students may pursue a dual degree through the departments of Epidemiology, Health Policy and Administration, Maternal and Child Health, Nutrition or Public Health Leadership. Dentistry, business, law, city and regional planning, and information and library science students may enroll in dual degree programs through the Department of Health Policy and Administration. A dual degree is also offered through the Department of Maternal and Child Health in conjunction with the School of Social Work and between the Department of Health Behavior and Health Education and the Department of City and Regional Planning.

Distance Education

Executive Master's Program: The Department of Health Policy and Administration provides graduate-level education to employed health professionals and health administrators through its Executive Master's program. This national program provides master's degree study to full-time health professionals throughout the United States and beyond. This program is comprised of intensive summer institutes on the Chapel Hill campus, faculty-guided distance learning and credit transfer from approved programs at other universities.

The Leadership M.P.H. is offered through the Public Health Leadership Program. This degree is designed for individuals who already have a professional identity and who have three to five years health-related experience but who desire to broaden their knowledge and skills in public health philosophy and sciences. Applicants come from a variety of professional disciplines and have a range of experiences.

The Doctoral Program in Health Leadership (Dr.P.H.) is available through the Department of Health Policy and Administration. This is the only program of its kind in the country that prepares working healthcare professionals to become top leaders. This highly competitive, distance learning program uses the latest Internet technology to connect distinguished faculty and students in an unparalleled educational environment.

Department of Biostatistics (BIOS)

MICHAEL R. KOSOROK, *Chair*
Jianwen Cai, *Associate Chair*

Professors

Michael R. Kosorok (88)
Jianwen Cai (93) Survivial Analysis and Regression Models, Clinical Trials, Analysis of Correlated Responses
Jason Fine (54)
Joseph G. Ibrahim (11) Bayesian Inference, Missing Data Problems, Bayesian Survival Analysis, Generalized Linear Models, Genomics
William D. Kalsbeek (55) Sample Design, Survey Analysis, Nonsampling Errors
Alan F. Karr, Inference for Stochastic Processes, Image Analysis (Joint with Statistics)
Gary G. Koch (14) Categorical Data Analysis, Nonparametric Methods
Lawrence L. Kupper (19) Regression Analysis, Statistical Applications in Epidemiology and in Environmental Health
Danyu Lin (89) Survival Analysis, Semiparametric Statistical Methods, Clinical Trials
Pranab K. Sen (10) Statistical Inference, Clinical Trials, Multivariate Analysis (Joint with Statistics)
Chirayath M. Suchindran (29) Statistical Demography
Kinh N. Truong (90) Time Series Analysis, Nonparametric Regression, Bootstrap Methods, Hazard Regression, Splines

Associate Professors

Lloyd J. Edwards (95) Longitudinal Data Analysis, Measurement Error Models, Clinical Trials
Bahjat Qaqish (94) Generalized Linear Models, Survival Analysis, Statistical Computing
Fred A. Wright (7) Statistical Genetics
Haibo Zhou (40) Missing/Auxiliary Data, Survival Analysis, Human Fertility
Amy H. Herring (87) Survival Analysis, Missing Data Methods, Environmental Statistics
Donglin Zeng (5) High Dimensional Data, Survival Analysis
Hongtu Zhu (48)
Fei Zou (4) Statistical Genetics

Assistant Professors

Mayetri Gupta (39) Statistical Methods for Computational Biology, Stochastic Computation and Monte Carlo Methods, Bayesian Inference and Model Selection
Anastasia Ivanova (83) Clinical Trials Design, Sequential Design of Binary Response Experiments, Statistical Methodology in Biostatistics
Wei Sun (53)

Research Professors

Richard E. Bilsborrow (30) Economic Demography, Demography, Economic Development, Environment
Shrikant I. Bangdiwala (80) Nonparametric Methods, Clinical Trials Methodology, International Health, Injury Prevention
Lloyd E. Chambless (82) Epidemiological Applications, Analysis of Survey Data, Measurement Error
Robert M. Hamer (28) Linear Models, Mixed Models, Clinical Trials
Lisa LaVange (45) Clinical Trials
John S. Preisser, Jr (89) Categorical Data, Longitudinal Data Analysis

Research Associate Professors

Haitao Chu (96)

Michael Hudgens (42) Nonparametric Estimation, Group Testing, Causal Inference, Infectious Diseases
Paul W. Stewart (84) Linear Models, Distribution Theory, Statistical Inference, Longitudinal Data
David J. Couper (77) Epidemiological Methods, Longitudinal Data, Data Quality

Research Assistant Professors

Diane Catellier (78) Linear Models, Missing Data, Clinical Trials
Ethan Lange, Genetics
Todd A. Schwartz (13) Categorical Data, Clinical Trials

Clinical Assistant Professor

Jane Monaco (43) Survival Analysis, Correlated Failure Time Data

Research Instructor

Katherine J. Roggenkamp (3) Statistical Computing

Adjunct Professors

Paul Beimer
David B. Dunson Bayesian Methods, Latent Variables, Nonparametric Processes, Model Uncertainty, Correlated and Multivariate Data, Reproductive Epidemiology, Bioinformatics.
Norman L. Kaplan, Stochastic Processes, Statistical Genetics
Herman E. Mitchell, Clinical Trials, Health Care Research, Clinical Epidemiology
Sally Morton
Shyamal D. Paddada
Ibrahim A. Salama (38) Nonparametric Statistics, Order Statistics, Ergodic Theory
Babubhai V. Shah (49) Survey Data Analysis Software, Multivariate Data Analysis, and Quality Assurance
Clarice R. Weinberg, Statistical Methods in Epidemiology and in Environmental Health, Reproductive Epidemiology
Russell Wolfinger, Statistical Computation

Adjunct Associate Professors

J. Michael Bowling, Survey Methodology, Evaluation, Injury Prevention
Kerrie E. Boyle, Demographic Models, Survey Statistics
Maura E. Stokes, Categorical Data Analysis

Adjunct Assistant Professors

Sonia M. Davis, Bioequivalence, Statistics in the Pharmaceutical Industry
Hrishikesh Chakraborty, HIV/AIDS
Christopher S. Coffey Adaptive Designs, Internal Pilots
Sandra S. Stinnett, Statistical Consulting and Education, Epidemiologic Methods
Douglas J. Taylor (12) Child Development, Environmental Health Statistics, Sexually Transmitted Diseases, Repeated Measures Analysis
Dennis D. Wallace

Professors Emeriti

Regina C. Elandt-Johnson
James E. Grizzle
Ronald W. Helms
Keith E. Muller (76) Linear and Nonlinear Repeated Measures Models, Study Design
Dana E. Quade
Michael J. Symons (17) Consulting, Bayesian Applications, Statistical Education
Craig D. Turnbull (26) Public Health Statistics, Research on Perinatal Outcomes and Behavioral Sciences
H. Bradley Wells

Courses

511 [111] INTRODUCTION TO STATISTICAL COMPUTING AND DATA MANAGEMENT (4). Prerequisite, previous or concurrent course in applied statistics or permission of the instructor. Introduction to use of computers to process and analyze data, components of digital computers, characteristics of magnetic storage devices, use of JCL and utility programs, concepts and techniques of research data management, use of statistical program packages and interpretation. Fall.

540 [140] PROBLEMS IN BIOSTATISTICS (1–21). Prerequisites to be arranged with the faculty in each case. A course for students of public health who wish to make a study of some special problem in the statistics of the life sciences and public health. Fall, spring and summer.

541 [141] QUANTITATIVE METHODS FOR HEALTH CARE PROFESSIONALS I (4). Permission of the instructor. Course is designed to meet the needs of health care professionals who need to be able to critically appraise the design and analysis of medical and health care studies and intend to pursue academic research careers. Covers basics of statistical inference, analysis of variance, multiple regression, categorical data analysis and an introduction to logistic regression and survival analysis. Emphasis is on applied data analysis of major health care studies. Fall.

542 [142] QUANTITATIVE METHODS FOR HEALTH CARE PROFESSIONALS II (4). Prerequisites, BIOS 541 and permission of the instructor. Continuation of BIOS 541. Main emphasis is on logistic regression. Other topics include exploratory data analysis and survival analysis. Spring.

545 [145] PRINCIPLES OF EXPERIMENTAL ANALYSIS (3). Prerequisites, BIOS 600 or equivalent, a basic familiarity with a statistical software package (preferably SAS) that has the capacity to do multiple linear regression analysis, permission of the instructor except for majors in the School of Public Health. Continuation of BIOS 600; the analysis of experimental and observational data, including multiple regression, and analysis of variance and covariance. Fall and spring.

550 [150] BASIC ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE I (GNET 636) (4). Prerequisite, MATH 232 or equivalent. Fundamentals of probability, discrete and continuous distributions; functions of random variables; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. Fall.

551 [151] BASIC ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisite, BIOS 550 or equivalent, a basic familiarity with a statistical software package (preferably SAS) that has the capacity to do multiple linear regression analysis or permission of the instructor. The theory and application of multiple linear regression and related analysis of variance (ANOVA) methods. The theory and application of maximum likelihood-based modeling methods, including logistic regression and Poisson regression. Spring.

600 [110] PRINCIPLES OF STATISTICAL INFERENCE (3). Prerequisite, knowledge of basic descriptive statistics. Major topics include elementary probability theory, probability distributions, estimation, tests of hypotheses, chi-squared procedures, regression and correlation. Fall and spring.

660 [160] PROBABILITY AND STATISTICAL INFERENCE I (3). Prerequisite, MATH 233 or equivalent. Introduction to probability, discrete and continuous random variables, expectation theory, bivariate and multivariate distribution theory, regression and correlation, linear functions of random variables, theory of sampling, introduction to estimation and hypothesis testing. Fall.

661 [161] PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisite, BIOS 660. Distribution of functions of random variables, Helmert transformation theory, central limit theorem and other asymptotic theory, estimation theory, maximum likelihood methods, hypothesis testing, power, Neyman-Pearson Theorem, likelihood ratio, score, and Wald tests, noncentral distributions. Spring.

662 [162] INTERMEDIATE STATISTICAL METHODS (4). Prerequisites or corequisites, BIOS 511 and 550 or equivalents. Principles of study design, descriptive statistics and sampling from finite and infinite populations, with particular attention to inferences about location and scale for one, two or k sample situations. Both distribution-free and parametric approaches are considered. Gaussian, binomial and Poisson models, one-way and two-way contingency tables, as well as related measures of association, are treated. Fall.

663 [163] INTERMEDIATE LINEAR MODELS (4). Prerequisite, BIOS

662 or equivalent. Matrix-based treatment of regression, one-way and two-way ANOVA, and ANCOVA, emphasizing the general linear model and hypothesis, as well as diagnostics and model building. The course begins with a review of matrix algebra, and it concludes with some treatment of statistical power for the linear model and with binary response regression methods. Spring.

664 [164] SAMPLE SURVEY METHODOLOGY (STOR 358) (4). Prerequisite, BIOS 550 or equivalent or permission of the instructor. Fundamental principles and methods of sampling populations, with primary attention given to simple random sampling, stratified sampling and cluster sampling. Also, the calculation of sample weights, dealing with sources of nonsampling error and analysis of data from complex sample designs are covered. Practical experience in sampling is provided by student participation in the design, execution, and analysis of a sampling project. Spring.

665 [165] ANALYSIS OF CATEGORICAL DATA (3). Prerequisites, BIOS 545, 550 and 662, or permission of the instructor. Introduction to the analysis of categorized data: rates, ratios and proportions; relative risk and odds ratio; Cochran-Mantel-Haenszel procedure; survivorship and life table methods; linear models for categorical data. Applications in demography, epidemiology and medicine. Fall.

666 [166] APPLIED MULTIVARIATE ANALYSIS (3). Prerequisite, BIOS 663 or equivalent. Application of multivariate techniques, with emphasis on the use of computer programs. Multivariate analysis of variance, multivariate multiple regression, weighted least squares, principal component analysis, canonical correlation and related techniques. On demand.

667 [167] APPLIED STOCHASTIC PROCESSES (3). Prerequisite, BIOS 661 or equivalent. Markov chains, Poisson processes and extensions, epidemic models, branching processes and other stochastic models of empirical processes. Disease, population and other biostatistical applications. Spring.

668 [168] DESIGN OF PUBLIC HEALTH STUDIES (3). Prerequisites, BIOS 545, 550 or equivalent. Statistical concepts in basic public health study designs: cross-sectional, case-control, prospective and experimental (including clinical trials). Validity, measurement of response, sample size determination, matching and random allocation methods. Spring.

670 [170] DEMOGRAPHIC TECHNIQUES I (3). Source and interpretation of demographic data; rates and ratios, standardization, complete and abridged life tables; estimation and projection of fertility, mortality, migration and population composition. Fall.

680 [180] INTRODUCTORY SURVIVORSHIP ANALYSIS (3). Prerequisite, BIOS 661 or permission of the instructor. Introduction to concepts and techniques used in the analysis of time to event data, including censoring, hazard rates, estimation of survival curves, regression techniques, applications to clinical trials. Spring.

691 [191] FIELD OBSERVATIONS IN BIOSTATISTICS (1). Field visits to, and evaluation of, major nonacademic biostatistical programs in the Research Triangle area. Field fee: $25. Fall.

735 [235] STATISTICAL COMPUTING—BASIC PRINCIPLES AND APPLICATIONS (3). Prerequisites, BIOS 661 and familiarity with at least one computer system and with either a computer language (C, FORTRAN, etc.) or a computer package (SAS, SPSS, etc.). Basic theory and application of computing as a tool in statistical research and practice. Topics include algorithms and data structures, linear and nonlinear systems, function approximation, numerical integration, the EM algorithm, simulation and document preparation. Spring.

740 [240] SPECIALIZED METHODS IN HEALTH STATISTICS (1–21). Prerequisite, permission of the instructor. Statistical theory applied to special problem areas of timely importance in the life sciences and public health. Lectures, seminars and/or laboratory work, according to the nature of the special area under study. Fall, spring and summer.

750 [250] ADVANCED TECHNIQUES IN BIOMETRY (1–21). Prerequisites, BIOS 661, 663 or equivalents, permission of the instructor. Up to three or four separate one-semester-hour modules presenting advanced techniques in biometry (topics covered usually vary at each offering). A knowledge of elementary computer programming is assumed. Fall, spring and summer.

756 [256] INTRODUCTION TO NONPARAMETRIC STATISTICS (3). Prerequisite, BIOS 661 or equivalent. Theory and application of nonparametric methods for various problems in statistical analysis. Includes procedures based on randomization, ranks and U-statistics. A knowledge of elementary computer programming is assumed.

758 [258] ADVANCED STATISTICAL METHODS IN BIOMETRIC AND PUBLIC HEALTH (4). Prerequisites, BIOS 660 and 661 or equivalents. A nonmeasure theoretic introduction to probability theory, random elements, statistics and stochastic processes. Random walks, Markov chains, Poisson processes and martingales. Exponential family of densities, finite sample distributions and the need for large sample methods. Basic properties of statistical estimators, Cramer-Rao bound and the Rao-Blackwell theorem. Stochastic convergence and central limit theorems. Slutsky's theorem, transformation of variables and statistics, and variance stabilization. Neyman-Pearson fundamental lemma and finite sample hypothesis testing. Introduction to large sample inference methods. Likelihood ratio, Rao's score and Wald tests. Statistical inference for categorical data and regression models. Resampling plans. Elements of Bayes methods. Inference in bioassay, dosimetry and environmental studies. Fall.

759 [259] APPLIED TIME SERIES ANALYSIS (3). Prerequisites, BIOS 661 and 663 or equivalents, and permission of the instructor. Topics include correlograms, periodograms, fast Fourier transforms, power spectra, cross-spectra, coherences, ARMA and transfer-function models, spectral-domain regression. Real and simulated data sets are discussed and analyzed using popular computer software packages. Spring.

760 [260] ADVANCED PROBABILITY AND STATISTICAL INFERENCE I (3). Prerequisite, BIOS 661 or permission of the instructor. Measure space, sigma-field, Lebesgue measure, measurable functions, integration, Fubini-Tonelli theorem, Radon-Nikodym theorem, probability measure, conditional probability, independence, distribution functions, characteristic functions, exponential families, convergence almost surely, convergence in probability, convergence in distribution, Borel-Cantelli leema, strong law of large numbers, central limit theorem, the Cramer-Wold device, delta method, U-statistics, martingale central limit theorem. Least squares estimation, uniformly minimal variance and unbiased estimation, estimating functions, maximum likelihood estimation, Cramer-Rao lower bound, information bounds, LeCam's lemmas, consistency, asymptotic efficiency, expectation-maximization algorithm, nonparametric maximum likelihood estimation. Fall.

761 [261] ADVANCED PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisite, BIOS 760 or permission of the instructor. Elementary decision theory, utility, admissibility, minimax rules, loss functions, Bayesian decision theory, likelihood ratio, Wald, and score tests, Neyman-Pearson tests, UMP and unbiased tests, rank tests, contiguity theory, confidence sets, parametric and nonparametric bootstrap methods, jackknife and cross-validation, asymptotic properties of resampling methods. Elements of Stochastic processes, including Poisson process, renewal theory, discrete-time Markov chains, continuous-time Markov chains, Martingales and Brownian motion. Spring.

762 [262] ADVANCED LINEAR MODELS I (4). Prerequisites, BIOS 661 and 663, MATH 547, MATH 416 or 577. Theory and methods for continuous responses. Topics include matrix theory, the multivariate normal distribution, multivariate quadratic forms, estimability, reparameterization, linear restrictions and splines, estimation theory, weighted least squares, multivariate tests of linear hypotheses, multiple comparisons, confidence regions, prediction intervals, statistical power, mixed models, transformations and diagnostics, growth curve models, dose-response models, missing data. Fall.

763 [263] GENERALIZED LINEAR MODEL THEORY AND APPLICATIONS (4). Prerequisite, permission of the instructor if non-biostatistics major. Introduction to the theory and applications of generalized linear models, quasi-likelihoods and generalized estimating equations. Topics include logistic regression, overdispersion, Poisson regression, log-linear models, conditional

likelihoods, multivariate regression models, generalized mixed models and regression diagnostics. Spring.

764 [264] ADVANCED SURVEY SAMPLING METHODS (3). Prerequisite, BIOS 664 or equivalent. Continuation of BIOS 664 for advanced students: stratification, special designs, multistage sampling, cost studies, nonsampling errors, complex survey designs, employing auxiliary information and other miscellaneous topics. On demand.

765 [265] LINEAR MODELS IN CATEGORICAL DATA ANALYSIS (3). Prerequisites, BIOS 661, 663, 665 and 666 or equivalents. Theory of statistical methods for analyzing categorical data by means of linear models, multifactor and multiresponse situations, interpretation of interactions. Spring.

767 [267] ADVANCED LINEAR MODELS II (4). Prerequisite, BIOS 762. Theory and methods of linear statistical models for continuous response data, including definitions of parameters, hypotheses, isomorphic models, orthogonal polynomials, incomplete/informatively censored data; general linear univariate, multivariate and mixed (random effects) models and parameterizations for various classes of designed experiments and longitudinal studies; modeling covariance structures. Spring.

771 [271] DEMOGRAPHIC TECHNIQUES II (3). Prerequisites, BIOS 670 and integral calculus. Life table techniques; methods of analysis when data are deficient; population projection methods; interrelations among demographic variables; migration analysis; uses of population models. Spring.

777 [277] MATHEMATICAL MODELS IN DEMOGRAPHY (3). Prerequisite, permission of the instructor. A detailed presentation of natality models, including necessary mathematical methods, and applications; deterministic and stochastic models for population growth, migration. Fall. (2000 and alternate years.)

779 [231] BAYESIAN STATISTICS (3). Prerequisite, BIOS 762 or equivalent. Basic aspects of the Bayesian paradigm including Bayes' theorem, the likelihood principle, prior distributions, posterior distributions, and predictive distributions. Bayesian analysis of linear models, generalized linear models, random effects models, spatial models and survival models. Informative prior elicitation, model comparisons, Bayesian diagnostic methods and variable subset selection. Markov Chain Monte Carlo methods for computations. Bayesian methods for the design and analysis of clinical trials. Fall.

780 [280] THEORY AND METHODS FOR SURVIVAL ANALYSIS (3). Prerequisites, BIOS 760 and 761 or permission of the instructor. Counting process-martingale theory, Kaplan-Meier estimator, weighted log-rank statistics, Cox proportional hazards model, nonproportional hazards models, multivariate failure time data. Spring. Lin.

781 [281] STATISTICAL METHODS IN HUMAN GENETICS (3). Prerequisites, BIOS 661 and 663 or permission of the instructor. An introduction to statistical procedures in human genetics, Hardy-Weinberg equilibrium, linkage analysis (including use of genetic software packages), linkage disequilibrium and allelic association. Fall.

783 [283] STATISTICAL METHODS IN QUANTITATIVE GENETICS (3). Prerequisites, BIOS 661 and 663 or permission of the instructor. An introduction to the statistical basis of variation in quantitative traits, with focus on experimental crosses and decomposition of trait variation, linkage map construction, statistical methodologies and computer software for mapping quantitative trait loci. Issues involving whole-genome analysis will be highlighted. Spring.

784 [284] INTRODUCTION TO COMPUTATIONAL BIOLOGY (3). Prerequisites, BIOS 661 and 663, or permission of the instructor. Molecular biology, the construction of physical and genomic maps, cloning, sequence assembly, sequence analysis, DNA-RNA protein sequence alignment, sequence patterns, hidden Markov models, matching statistics and the Poisson approximation, discovery of functional motifs via likelihood and Monte Carlo Bayesian approaches, modeling secondary structure, computational algorithms, statistical software, applications to cancer. Spring.

785 [285] STATISTICAL METHODS FOR DNA MICROARRAY DATA (3). Prerequisites, BIOS 661 and 663, or permission of the instructor. Clustering algorithms, classification techniques, statistical techniques for analyzing multivariate data, analysis of high dimensional data, parametric and semiparametric models for DNA microarray data, measurement error models, Bayesian methods for analyzing microarray data, statistical software for analyzing microarray data, sample size determination in microarray studies, applications to cancer. Fall.

841 [341] PRINCIPLES OF STATISTICAL CONSULTING (3). Prerequisites, BIOS 545 or equivalent and permission of the instructor except for majors in the department. An introduction to the statistical consulting process, emphasizing its nontechnical aspects. Spring.

842 [342] PRACTICE IN STATISTICAL CONSULTING (1–21). Prerequisites, BIOS 511, 545, 550, 841 or equivalents, and permission of the instructor. Under supervision of a faculty member, the student interacts with research workers in the health sciences, learning to abstract the statistical aspects of substantive problems, to provide appropriate technical assistance and to communicate statistical results. Fall, spring and summer.

850 [350] TRAINING IN STATISTICAL TEACHING IN THE HEALTH SCIENCES (1–21). Prerequisite, a minimum of one year of graduate work in statistics. Principles of statistical pedagogy. Students assist with teaching elementary statistics to students in the health sciences. Students work under the supervision of the faculty, with whom they have regular discussions of methods, content and evaluation of performance. Fall, spring and summer.

889 [389] RESEARCH SEMINAR IN BIOSTATISTICS (0.5–21). Prerequisite, permission of the instructor. Seminar on new research developments in selected biostatistical topics. Fall and spring.

990 [390] RESEARCH IN BIOSTATISTICS (1–21). Individual arrangements may be made by the advanced student to spend part or all of his or her time in supervised investigation of selected problems in statistics. Fall, spring and summer.

992 [392] MASTER'S PAPER (3–6). Fall, spring and summer.

993 [393] MASTER'S THESIS (3–6). Fall, spring and summer.

994 [394] DOCTORAL DISSERTATION (3–9). Fall, spring and summer.

Department of Environmental Sciences and Engineering (ENVR)

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MICHAEL D. AITKEN, *Chair*
Donald L. Fox, *Associate Chair*

Professors

Michael D. Aitken (66) Wastewater and Hazardous Waste Treatment, Applied Biotechnology
Richard N. L. (Pete) Andrews (50) Environmental Policy
Louise M. Ball (62) Metabolism, Toxicology and Genotoxicity of Xenobiotics
John M. Bane Jr., Marine Sciences, Physical Oceanography
Russell F. Christman (5) (Retired) Organic Water Chemistry, Pollutant Identification, Environmental Management Strategies
Francis A. DiGiano (51) (Retired) Water and Wastewater Treament Processes, Mathematical Modeling of Mass Transport
Michael R. Flynn (61) Relationship between Exposure and the Capture Efficiency of Local Exhaust Hoods, Computer-Aided Optimization of Ventilation Systems
Donald L. Fox (8) Atmospheric Chemistry
Avram Gold (43) Environmental Chemistry
William G. Gray (104) Environmental Modeling
Milton S. Heath Jr. (39) (Retired) Natural Resource Law
Harvey E. Jeffries (14) Atmospheric Chemistry, Modeling, and Computerized Data Acquisition
Richard M. Kamens (55) Atmospheric Gas-Particle Partitioning of Semivolatile

Toxic Organics, Reactions of Atmospheric PAH and Other Organic Toxics, Modeling Biogenic Aerosol Formation from Gas Phase Reactions
David H. Leith (56) Air Pollution Control Engineering, Aerosol Technology
Richard A. Luettich Jr., Marine Sciences, Physics of Shallow Water Bodies
Christopher S. Martens (92) Marine Sciences, Biogeochemistry
Cass T. Miller (59) Multiphase Porous Media Systems, Environmental Modeling
David H. Moreau (48) (Retired) Water Resources Planning
Leena A. Nylander-French (95) Quantitative Measurement of Skin and Inhalation Exposures to Toxicants, Exposure Modeling to Standardize and Improve Exposure and Risk Assessment
Hans W. Paerl (65) Environmental Microbial Ecology
Frederic K. Pfaender (25) Environmental Microbiology
Philip C. Singer (31) Water and Wastewater Treatment Processes, Aquatic Chemistry
Mark D. Sobsey (38) Environmental Microbiology, Virology, Toxicology
James A. Swenberg (77) Environmental Toxicology, Chemical Carcinogenesis
Paul B. Watkins, Director, The Verne S. Caviness General Clinical Research Center, UNC School of Medicine
Dale Whittington (70) Water Resources Economics, International Development

Associate Professors

Gregory W. Characklis (98) Water Resources
Ivan I. Rusyn (103) Environmental Genomics
Stephen C. Whalen (93) Biogeochemistry, Limnology, Greenhouse Gases

Assistant Professors

Rebecca C. Fry (7) Toxicogenomics and Genetic Toxicology
Jacqueline A. MacDonald (15) Environmental Risk Assessment, Environmental Decision Analysis
Marc L. Serre (100) Environmental Modeling, Hydrology, Geostatistics, GIS, Exposure Assessment, Environmental Epidemiology, Risk Assessment, Medical Geography.
William Vizuete (6) Air Quality Modeling
Jill R. Stewart (26) Water Quality Microbiology, Ecological Assessment and Prediction
Howard S. Weinberg (96) Aquatic Chemistry
J. Jason West (16) Air Pollution, Climate Change, Atmospheric Modeling, Global Health, Environmental Policy, Environmental Engineering

Research Assistant Professors

Gunnar Boysen (67) The interplay between chemical carcinogenesis and nutritional or lifestyle habits,such as diet selection and physical activity
Karupiah Jayaraj (29) Chemical Synthesis
Jun Nakamura (108) Environmental Toxicology
Otto D. (Chip) Simmons (111) Environmental Microbiology

Research Associate Professor

Lori A. Todd (75) Application of Computer Tomography and Optical Remote Sensing for Sampling and Evaluating Gases in Workplace Air

Adjunct Professors

Francis S. Binkowski, Air Quality, Meteorology
Linda S. Birnbaum (86) Xenotonic Metabolism, Biochemical Toxicology
Gaylen R. Brubaker, Bioremediation
Daniel L. Costa (97) Pulmonary Toxicology
David M. DeMarini (81) Genetic Toxicology
Alfred D. Eisner, Aerosol Science
David S. Ensor (80) Aerosol Science
Chong Kim, Human Exposure Assessment
Joellen Lewtas, Genetic Bioassays
Charles R. O'Melia, Water Chemistry
Paul W. Prendiville, Water and Wastewater Treatment Plant Design
Barbara T. Walton, Ecotoxicology, Bioremediation, Biomonitoring
William E. Wilson, Aerosols, Photochemistry, Smog Chambers

Adjunct Associate Professors

Philip W. Albro (58) Environmental Chemistry
Nelson W. Couch, Radiological Hygiene
John M. Dement (60) Industrial Hygiene
Robert T. Hitchcock, Physical Agents
R. Wayne Litaker, Coastal Estuaries
Joseph Pinto (82) Atmospheric Modeling
Jane Ellen Simmons (91) Hepatic and Renal Toxicology
Thomas B. Starr, Risk Assessment

Adjunct Assistant Professors

Martin W. Doyle, Hydrology
Jane E. Gallagher, Environmental Toxicology
M. Ian Gilmour, Immunotoxicology
Michael C. Madden, Ozone Reactions with Biomolecules
Rachel T. Noble (110) Marine Sciences
Andrew V. Petkash, Water and Wastewater Treatment Plant Design
Michael C. Piehler (33) Marine Environmental Sciences, Environmental Microbial Ecology
Terrence K. Pierson, Environmental Risk Assessment
Woodall Stopford, Occupational Medicine Physics
Douglas J. Taylor, Biostatistics
Russell W. Wiener (83) Indoor Air Quality, Aerosol Monitoring

Adjunct Lecturer

Raymond W. Hackney, Industrial Hygiene

Professors Emeriti

William H. Glaze
Robert L. Harris
J. Donald Johnson
Donald T. Lauria
Parker C. Reist
Morris A. Shiffman
Mark S. Shuman
Charles M. Weiss
James E. Watson Jr.

Clinical Professor Emeritus

Donald E. Francisco

Courses

296 [100] READING IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1–9). Prerequisite, permission required for students outside the department. Extensive library study of a specific subject in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each instance. Fall, spring and summer. Staff.

400 [103] SEMINAR SERIES (1). Presents the results of ongoing research projects in the Department of Environmental Sciences and Engineering. Topics and presenters are selected from among the departmental graduate students and faculty. Fall and spring. Weinberg.

401 [104] UNIFYING CONCEPTS (3). Unifying concepts of environmental systems, including conservation principles, modeling, economics and policy with applications from throughout natural, engineered and human systems. Interfaces among scientific, engineering and policy aspects of the field. Fall. Staff.

402 [105] PROBLEM BASED LEARNING (2). Prerequisite, permission of the instructor. A problem common to the field of environmental science will be studied in detail through the use of small groups of students from the various disciplinary areas in the department. Staff.

403 [110] ENVIRONMENTAL CHEMISTRY PROCESSES (ENST 403) (3). Prerequisite, a background in chemistry and mathematics, including ordinary differential equations. Chemical processes occurring in natural and engineered systems: chemical cycles; transport and transformation processes of chemicals in air, water and multimedia environments; chemical dynamics; ther-

modynamics; structure/activity relationships. Fall and summer. Kamens.

411 [111] LABORATORY TECHNIQUES AND FIELD MEASUREMENTS (3). Students learn laboratory, field, and analytical skills. Provides a solid introduction to experimental research in environmental sciences and engineering. Students are provided with applications in limnology, aquatic chemistry and industrial hygiene. Fall. Nylander-French, Weinberg, Whalen.

412 [112] ECOLOGICAL MICROBIOLOGY (3). Prerequisite, one course in general microbiology. A description of microbial populations and communities, the environmental processes they influence, and how they can be controlled to the benefit of humankind. Spring. Pfaender.

413 [113] LIMNOLOGY (3). Prerequisites, introductory biology, chemistry and physics. Basic aspects of freshwater ecosystem function. Emphasis on trophic level interactions and integration of physical, chemical and biological principles for a holistic view of lake ecosystem dynamics. Three lecture hours per week. Fall. Whalen.

415 [115] BIOGEOCHEMICAL PROCESSES (ENST 450, GEOL 450, MASC 450) (4). Prerequisites, CHEM 251 or 261, MATH 231, PHYS 105 or 117, or permission of the instructor. Principles of chemistry, biology and geology are applied to analysis of the fate and transport of materials in environmental systems, with an emphasis on those materials that form the most significant cycles. The course examines these processes in systems that contain the hydrosphere, lithosphere, atmosphere and biosphere. Three lecture hours and one laboratory hour per week. Fall. (Even-numbered years.) Arnosti.

416 [116] INTRODUCTION TO AEROSOL SCIENCE (4). Prerequisite, admission to the Department of Environmental Sciences and Engineering or permission of the instructor. Physical and chemical principles underlying behavior of particles suspended in air. Topics include rectilinear and curvilinear motion of the particles in a force field, diffusion, evaporation and condensation, electrical and optical properties, and particle coagulation, as well as the behavior of the cloud in toto. Three lecture hours and two lab hours per week. Fall. (Even-numbered years.) Leith.

417 [117] OCEANOGRAPHY (BIOL 350, GEOL 403, MASC 401) (3). Prerequisites, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record and the history of oceanography. Term paper. Intended for students with a college science background; other students should see GEOL 103. Three lecture hours per week. Fall and spring. Staff.

419 [119] CHEMICAL EQUILIBRIA IN NATURAL WATERS (3). Principles and applications of chemical equilibria to natural waters. Acid-base, solubility, complex formation and redox reactions are discussed. This course uses a problem-solving approach to illustrate chemical speciation and environmental implications. Three lecture hours per week. Fall. Singer.

421 [133] ENVIRONMENTAL HEALTH MICROBIOLOGY (3). Prerequisite, introductory course in microbiology or permission of the instructor. Presentation of the microbes of public health importance in water, food and air, including their detection, occurrence, transport and survival in the environment; epidemiology, and risks from environmental exposure. Two lecture and two laboratory hours per week. Spring. (Odd-numbered years.) Sobsey.

422 [134] AIR AND INDUSTRIAL HYGIENE (3). Problem definition, sources of information, health effects, legislative framework and control methods for chemical, physical and biological hazards. Recognition, evaluation and remediation of hazards associated with community and industrial environments. Three lecture hours per week. Fall. Fox.

423 [135] INDUSTRIAL TOXICOLOGY (3). Toxicological assessment of and a case presentation of related exposure is given. A conceptual approach is utilized to design appropriate programs to prevent worker ill health due to industrial toxicant exposure. Two lecture hours per week. Spring. Staff.

430 [130] HEALTH EFFECTS OF ENVIRONMENTAL AGENTS (3). Prerequisites, basic biology, chemistry through organic, math through calculus; permission of the instructor if prerequisites not met. Interactions of environmental agents (chemicals, infectious organisms, radiation) with biological systems (including humans), with particular attention to routes of entry, distribution, metabolism, elimination and mechanisms of adverse effects. Three lecture hours per week. Fall. Ball.

431 [131] TECHNIQUES IN ENVIRONMENTAL HEALTH SCIENCES (2). Prerequisites, basic biology, chemistry through organic, math through calculus; permission of the instructor if prerequisites are not met. A practical introduction to the measurement of biological end-points, emphasizing adverse effects of environmental agents, using laboratory and field techniques. Two laboratory hours per week. Fall. Ball, Sobsey.

432 [137] OCCUPATIONAL SAFETY AND ERGONOMICS (PHNU 786, PUBH 786) (3). Fundamentals of occupational safety and ergonomics with emphasis on legislation and organization of industrial safety and ergonomic programs, including hazard recognition, analysis, control and motivational factors pertaining to industrial accident and cumulative trauma disorder prevention. Fall. Staff.

433 [138] HEALTH HAZARDS OF INDUSTRIAL OPERATION (3). Prerequisite, ENVR 422. An introduction to the health hazards associated with the various unit operations of industry. Field trips to local industries planned. Spring. Flynn.

434 [139] THEORY AND PRACTICE OF EXPOSURE EVALUATION (3). Prerequisite. ENVR 416. Methodology and philosophy of evaluating exposures to air contaminants in the workplace. Course is divided into lectures, case-study analyses and hands-on term project. Three lecture hours per week. Spring. Staff.

442 [132] BIOCHEMICAL TOXICOLOGY (BIOC 442, TOXC 442) (3). Prerequisites, CHEM 430 plus one course in biochemistry; permission of the instructor if prerequisites not met. Biochemical actions of toxicants and assessment of cellular damage by biochemical measurements. Three lecture hours per week. Spring. Rusyn.

449 [114] ECOLOGY OF WETLANDS (MASC 449) (4). Prerequisites, one year of biology, one year of chemistry, one semester of ecology and permission of the instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on systems of the southeastern United States. Fall. Staff.

450 [150] PRINCIPLES AND APPLICATIONS OF ENVIRONMENTAL ENGINEERING (3). Principles that govern the behavior of contaminants in air and water. Application of these principles to engineered processes that control air and water quality. Three lecture hours per week. Spring. Singer, Leith.

451 [151] PROCESS DYNAMICS IN ENVIRONMENTAL SYSTEMS (3). Prerequisites, MATH 524 or equivalent and permission of the instructor. Application of fluid transport, mass transfer and chemical reactor principles to describe important processes in water/wastewater treatment, air pollution control and natural systems. Three lecture hours per week. Fall. Vizuete.

452 [152] FLUID DYNAMICS (GEOL 560, MASC 560, PHYS 660) (3). Prerequisite, PHYS 301 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers and irrational incompressible flow. Three lecture hours per week. Spring. Scotti.

453 [153] GROUNDWATER HYDROLOGY (3). Prerequisites, math through differential equations and some familiarity with fluid mechanics. Conservation principles for mass, momentum and energy developed and applied to groundwater systems. Scope includes the movement of water, gas and organic liquid phases, and the transport and reaction of contaminants. Three lecture hours per week. Fall. Miller.

461 [160] ENVIRONMENTAL SYSTEMS MODELING (ENST 415, GEOL 415, MASC 415) (3). Prerequisites, MATH 383, PHYS 105 or PHYS 117 (may be taken concurrently) or permission of the instructor. Methods for

developing explanatory and predictive models of environmental processes are explored. Includes discussion of the relevant scientific modes of analysis, mathematical methods, computational issues and visualization techniques. Two lecture and one computer laboratory hour per week. Spring. Rial, Werner, staff.

462 [161] GEOSTATISTICS FOR SPATIAL/TEMPORAL ENVIRONMENTAL PHENOMENA (3). Prerequisite, statistics. Stochastic analysis of space-time environmental phenomena. Random field modeling of physical laws. Geostatistical estimation and simulation. Natural heterogeneity. Stochastic PDE of groundwater flow and solute transport. Fall. Staff.

463 [162] RANDOM FIELD MODELING OF PHYSICAL PROCESSES (3). Prerequisite, calculus through differential equations is desirable. Science of the probable. Random fields. Physical significance and methodological theses. Spatial and spatiotemporal variability. Ordinary and generalized fields of natural processes. Transport-type models. Bayesian/Maximum entropy estimation. Three lecture hours per week. Spring. Staff.

468 [167] ADVANCED FUNCTION OF TEMPORAL GIS (ENST 468) (3). Advanced function of Temporal Geographical Information Systems (TGIS). These fields describe natural, epidemiological, economic and social phenomena distributed across space and time. Three lecture hours per week. Fall. Serre.

470 [175] ENVIRONMENTAL RISK ASSESSMENT (ENST 470) (3). Prerequisites, ENVR 403 and 430. Methods of environmental risk assessment, including hazard identification, exposure assessment, exposure-response assessment and risk characterization are developed and applied. Three lecture hours per week. Spring. Crawford-Brown.

471 [176] QUANTITATIVE RISK ASSESSMENT IN ENVIRONMENTAL HEALTH MICROBIOLOGY (3). Prerequisites, microbiology, epidemiology and infectious diseases recommended. Survey of alternative approaches, frameworks and decision making tools for quantitative risk assessment of microbial pathogens that infect humans and cause disease by the exposure routes of water, food, air and other vehicles. Spring. (Even-numbered years.) Sobsey.

480 [154] MARINE SYSTEMS MODELING (GEOL 480, MASC 480) (1–3). Prerequisite, MATH 232 or permission of the instructor. Mathematical modeling of the dynamic system, linear and nonlinear. The fundamental budget equation. Case studies in modeling convective transport, biogeochemical process, population dynamics. Analytical and numerical techniques, chaos theory, fractal geometry. Three lecture hours per week. Spring. Werner, Rial.

505 [118] CHEMICAL OCEANOGRAPHY (GEOL 505, MASC 505) (4). Prerequisite, one semester of physical chemistry or CHEM 480, or permission of the instructor. Overview of chemical processes in the ocean. Topics include physical chemistry of seawater, major element cycles, hydrothermal vents, geochemical tracers, air-sea gas exchange, particle transport, sedimentary processes and marine organic geochemistry. Three lecture and two recitation hours per week. Spring. Martens, Arnosti, Alperin.

516 [116L] AEROSOL SCIENCE LABORATORY (2). Prerequisite or corequisite, ENVR 416. Basic laboratory exercises in aerosol sciences. Fall. (Alternate years.) Leith.

520 [120] BIOLOGICAL OCEANOGRAPHY (BIOL 657, MASC 504) (4). Prerequisite, BIOL 201 or 475 or permission of the instructor. Physical, chemical and biological factors characterizing estuarine and marine environments emphasizing factors controlling animal and plant populations. Includes experimental approaches and methods of analysis, sampling and identification. Spring. Lindquist.

522 [181] ENVIRONMENTAL CHANGE AND HUMAN HEALTH (ENST 522) (3). Prerequisites, ENST 201 or ENST 202. The course will provide students with a multidisciplinary perspective of environmental changes to encompass both human health and ecological health.

552 [125] ORGANIC GEOCHEMISTRY (GEOL 552, MASC 552) (3). Prerequisites, MASC 505 or CHEM 261, or permission of the instructor. Sources, transformations and fate of natural organic matter in marine environments. Emphasis on interplay of chemical, biological and physical processes which affect organic matter composition, distribution and turnover. Fall. (Alternate years.) Arnosti.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, PLAN 585, PLCY 585) (3). Intensive introduction to environmental management and policy including environmental and health risks, policy institutions, processes and instruments; policy analysis; and major elements of American environmental policy. Lectures and case studies. Three lecture hours per week. Fall. Andrews.

600 [101] ENVIRONMENTAL HEALTH (2). Survey course: Relationship between environmental quality, human health and welfare. Contamination in human environment; physical, biological and social factors; trade-offs regarding prevention and remediation measures. Lectures, group discussions and projects. Emphasizes critical thinking. Satisfies core School of Public Health requirement. Two credit hours per week. Fall and spring. Staff.

661 [163] SCIENTIFIC COMPUTATION I (MATH 661) (3). Prerequisites, some programming experience and basic numerical analysis. Error in computation, solutions of nonlinear equations, interpolation, approximation of functions, Fourier methods, numerical integration and differentiation. Introduction to numerical solution of ODEs, Gaussian elimination. Three lecture hours per week. Fall. Minion.

662 [164] SCIENTIFIC COMPUTATION II (COMP 760, MATH 662) (3). Prerequisite, MATH 661. Theory and practical issues arising in linear algebra problems derived from physical applications, e.g., discretization of ODEs and PDEs. Linear systems, linear least squares, eigenvalue problems, singular value decomposition. Three lecture hours per week. Spring. Camassa.

668 [165] METHODS OF APPLIED MATHEMATICS I (MATH 668) (3). Prerequisite, undergraduate differential equations. Contour integration, asymptotic expansions, steepest descent/stationary phase methods, special functions arising in physical applications, elliptic and theta functions, elementary bifurcation theory. Three lecture hours per week. Fall. McLaughlin.

669 [166] METHODS OF APPLIED MATHEMATICS II (MATH 669) (3). Prerequisite, MATH 668 or permission of the instructor. Perturbation methods for ODEs and PDEs, WKBJ method, averaging and modulation theory for linear and nonlinear wave equations, long-time asymptotics of Fourier integral representations of PDEs, Green's functions, dynamical systems tools. Three lecture hours per week. Spring. Camassa.

685 [286] WATER AND SANITATION PLANNING AND POLICY IN DEVELOPING COUNTRIES (PLAN 685) (3). Permission of the instructor. Seminar on policy and planning approaches for providing improved community water and sanitation services in developed countries. Topics include the choice of appropriate technology and level of service, pricing, metering and connection charges; cost recovery and targeting subsidies to the poor; water vending; community participation in the management and operation of water systems; and rent-seeking behavior in the provision of water supplies. Three seminar hours per week. Spring. Whittington.

686 [186] POLICY INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT (ENST 686, PLAN 686, PLCY 686) (3). Prerequisite, ECON 410 or PLAN 710 or equivalent. Design of public policy instruments as incentives for sustainable management of environmental resources and ecosystems, and comparison of the effects and effectiveness of alternative policies. Fall. Andrews, Whittington.

701 [216] ECOLOGY OF AQUATIC PLANTS AND WETLAND ECOSYSTEMS (3). Prerequisites, BIOL 101, CHEM 101, 102 or permission of the instructor. Adaptations of aquatic plants and microorganisms of land-water interface regions of lakes and rivers, their nutrition, growth, population dynamics, competition, herbivory, productivity, physiological control measures. Wetlands functions, values to humans. Three lecture hours per week. Spring. (Even-numbered years.) Staff.

707 [231] ADVANCED TOXICOLOGY (PHCO 707, TOXC 707) (3). Prerequisite, PHCO 702 or permission of the instructor. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on organ-specific

toxicology, developmental toxicology and radiation toxicology. Three lecture hours per week. Fall. Swenberg.

710 [254] ENVIRONMENTAL PROCESS BIOTECHNOLOGY (3). Prerequisite, a previous or concurrent course in microbiology. Theory and practice of biological processes used to remove contaminants from environmental media, including water, wastewater, soil and air. Spring. Aitken.

722 [234] SEMINARS IN TOXICOLOGY (TOXC 722) (1). This course will consist of presentations by the outside invited speakers, local faculty, advanced graduate students and postdoctoral trainees. Topics will cover all areas of research in toxicology. One seminar hour per week. Fall and spring. Rusyn.

724 [201] CURRENT TOPICS IN ENVIRONMENTAL ANALYTICAL CHEMISTRY (1). Students will select, critically review, and discuss current research papers for content, relevance, innovation and clarity. Papers can be from any aspect of the environmental sciences. Two lecture hours per week, every other week Fall. (Even-numbered years.) Weinberg.

725 [210] ENVIRONMENTAL PHYSICAL-ORGANIC CHEMISTRY (3). The physical chemistry of the partitioning, exchange and chemical transformation of organic contaminants in the water, air and soil environments. Spring. Kamens.

726 [211] INSTRUMENTAL METHODS FOR THE CHEMICAL ANALYSIS OF ENVIRONMENTAL SAMPLES (3). Prerequisite, basic or general chemistry. Emphasis on acquiring laboratory skills and hands-on experience with instrumentation; sample handling and preparation; modern analytical techniques to include chromatography and spectroscopy; quality assurance and control. One lecture hour and four laboratory hours per week. Spring. Weinberg.

727 [213] CHEMISTRY OF HUMIC SUBSTANCES (1). Prerequisites, organic or physical chemistry and permission of the instructor. Critical analysis for Ph.D. students of the chemistry, role and function of refractory organic matter in aquatic environments. Two lecture hours per week. Fall. Christman.

728 [214] ANALYSIS OF TRACE ORGANICS (3). Prerequisites, CHEM 261–262, CHEM 481–482, and PHYS 104–105; permission of the instructor required if prerequisites not met. Basic principles of isolation, separation, and identification of trace organic chemicals in environmental and/or biological samples, including solvent extraction, liquid and gas chromatography, and mass spectrometry. Three lecture hours per week. Spring. Hass, Albro.

729 [212] REDOX PROCESSES (3). Prerequisite, physical chemistry. Redox processes in the aquatic environment. Includes thermodynamics and kinetics; photochemical process in aquatic systems; oxidation processes for treatment of natural and anthropogenic organics, using ozone, peroxides and UV radiation. Three lecture hours per week. Spring. (Alternate years.) Weinberg.

732 [232] HEALTH EFFECTS OF OUTDOOR AND INDOOR AIR POLLUTION (3). Prerequisite, knowledge of basic human physiology and biochemistry helpful. Assessing health effects of air pollutants on normal and diseased human populations, including children. Physiology, cellular and molecular biology, immunology, genetics, dosimetry will be integrated. Three lecture hours per week. Fall. Hazucha.

740 [230] PRINCIPLES OF CHEMICAL CARCINOGENESIS (2). Prerequisite, organic chemistry. Bioactivation of carcinogens; interaction of activated metabolites with DNA, and their effects on DNA structure, replication, repair and the control of these processes during development of chemically induced carcinogenesis. Two lecture hours per week. Spring. Gold.

750 [250] PRINCIPLES OF INDUSTRIAL VENTILATION (3). Prerequisites, calculus and physics; permission of the instructor. Principles of industrial ventilation for contaminant control and design of such systems. Basic laboratory exercises. Two lecture and one laboratory hour per week. Fall. Flynn.

751 [250D] VENTILATION DESIGN PROBLEM (1). Corequisite, ENVR 750; prerequisite, permission of the instructor. Design problem for industrial operation. One seminar hour per week. Fall. Flynn.

754 [251] AIR POLLUTION CONTROL (3). Prerequisite , ENVR 422. Engineering control of air pollution control systems and discussion of air pollution regulation and standards. Spring. (Odd-numbered years.) Leith.

755 [252] ANALYSIS OF WATER RESOURCE SYSTEMS (3). Prerequisite for nonengineering students, permission of the instructor. Use of mathematical models to design and evaluate regional water supply and treatment systems. Engineering and economic methods are incorporated into quantitative analyses of regional scenarios. Social and political aspects also discussed. Three lecture hours per week. Fall. Characklis.

756 [253] PHYSICAL/CHEMICAL TREATMENT PROCESSES (3). Prerequisites, ENVR 419 or equivalent, and 451 or equivalent. Fundamental descriptions of disinfection, oxidation, coagulation, precipitation, sedimentation, filtration, adsorption, ion exchange and membrane processes; applications to water and wastewater treatment. Two lecture hours per week. Spring. DiGiano, Singer.

757 [255] WATER AND WASTEWATER TREATMENT PLANT DESIGN (3). Prerequisites, ENVR 756 and 710. The application of the theory of water and wastewater treatment to the design of municipal facilities. The course includes the principles of design and modern design practices. Design and analysis of design of specific works for water and wastewater treatment. Summer. Staff.

758 [256] ENVIRONMENTAL ENGINEERING PROJECT (3). Prerequisite, permission of the instructor. Ad hoc project designed for students to work as a team in addressing a current problem in environmental engineering. Projects may include: laboratory or pilot-scale studies; collection and analysis of data from full-scale systems; or comprehensive analysis of relevant problems in environmental engineering practice. Three lecture hours per week. Fall. Staff.

759 [265] MULTIPHASE TRANSPORT PHENOMENA (3). Prerequisite, ENVR 463 or 661 or equivalent. Continuum mechanical approach to formulating mass, momentum, energy, and entropy equations to describe multiphase transport phenomena. Three lecture hours per week. Fall. Miller.

761 [261] NUMERICAL ODE/PDE I (MATH 761, MASC 781) (3). Prerequisites, MATH 191, 192. Single, multistep methods for ODEs: stability regions, the root condition, stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations. Three lecture hours per week. Fall. Minion, Miller, Werner.

762 [262] NUMERICAL ODE/PDE II (MATH 762, MASC 782) (3). Prerequisite, MATH 661/662, a previous course in the theory of PDE, concurrent enrollment in MATH 751, or permission of the instructor. Elliptic equation methods (finite differences, elements, integral equations); Hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Three lecture hours per week. Spring. Minion, Miller, Werner.

763 [263] MATHEMATICAL MODELING I (MATH 768, MASC 783) (3). Prerequisites, MATH 668, 669, 661, 662. Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; deviation of classical models of fluid mechanics (lubrication, slender filament, thin filing, Stokes flow); deviation of weakly nonlinear envelope equations. Three lecture hours per week. Fall. Camassa, Forest, Miller, Werner.

764 [264] MATHEMATICAL MODELING II (MATH 769, MASC 784) (3). Prerequisites, MATH 668, 669, 661, 662. Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs); geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Three lecture hours per week. Spring. Camassa, Forest, Miller, Werner.

765 [275] MODEL-BASED EXPOSURE MAPPING AND RISK ASSESSMENT (3). Introduction to modern models and techniques for studying environmental and health systems which vary in space and time. Applications in environmental engineering, ecology, epidemiology, geography and health risk assessment. Spring. Serre.

766 [277] STOCHASTIC ENVIRONMENTAL HEALTH MODELING (3).

Prerequisite, statistics. A holistic/stochastic perspective, spatiotemporal random field modeling of environmental exposure and biological variabilities. Uncertainty in environmental exposure. Biomarkers and population damage indicators for epidemiological analysis. Cell-based stochastic differential equations. Three lecture hours per week. Spring. Staff.

767 [279] MODELING FOR ENVIRONMENTAL RISK ANALYSIS (3). Prerequisite, ENVR 470. Mathematical methods for development of advanced models in environmental risk assessment, including exposure assessment and exposure-response assessment, are developed and applied. Three lecture hours per week. Fall. Crawford-Brown.

768 [260] MICROENVIRONMENTAL AIR FLOW MODELING (3). Prerequisites, fluid mechanics and permission of the instructor. Applications of finite element and vortex methods for modeling air flows of significance in industrial hygiene applications. Three lecture hours per week. Fall. Flynn.

769 [276] ADVANCED METHODS OF EXPOSURE ASSESSMENT (3). Prerequisites, BIOS 551, 545 (545 may be taken concurrently), ENVR 430 or equivalent and permission of the instructor required for nonmajors. Covers the statistical and biological considerations in assessing environmental exposures to chemicals with particular attention to airborne chemicals in occupational settings. Spring. (Even-numbered years.) Rappaport.

770 [233] BIOLOGICAL MONITORING (2). Prerequisite, ENVR 430 or equivalent. This course provides both practical and theoretical information on biological monitoring of chemical exposures and how to evaluate and interpret exposure data. Two lecture hours per week and a term paper (two credit hours). Spring. Nylander-French.

781 [291] WATER RESOURCES PLANNING AND POLICY ANALYSIS (PLAN 781) (3). Prerequisite, permission of the instructor. Water resources planning and management. Federal and state water resources policies. Analytical skills to identify environmental problems associated with urban water resources development. Three lecture hours per week. Fall. Moreau.

784 [290] ENVIRONMENTAL LAW (PLAN 784) (3). Prerequisite, permission of the instructor. An examination of the law of resource use and development, its administration, and underlying policies. Particular attention to water resources law, regulatory law, and natural resource administration. Regulatory aspects of pollution control programs are covered. Three lecture hours per week. Fall. Heath.

785 [289] PUBLIC INVESTMENT THEORY (PLAN 785, PLCY 785) (3). Prerequisite, PLAN 710 or equivalent. Basic theory, process and techniques of public investment planning and decision making, involving synthesis of economic, political and technologic aspects. Theory underlying benefit-cost analysis; adaptation to a descriptive and normative model for planning public projects and programs. Three lecture hours per week. Spring. Whittington.

786 [292] ENVIRONMENTAL QUALITY PLANNING (PLAN 786) (3). Planning and analysis of regional environmental systems with focus on management of mass flows that affect the quality of the regional environment. Three lecture hours per week. Spring. Moreau.

850 [285] SYSTEMS ANALYSIS IN ENVIRONMENTAL PLANNING (3). Prerequisite, calculus. Applications of systems analysis techniques to the management of environmental quality. Spring. Lauria.

885 [288] CURRENT APPLICATIONS IN ENVIRONMENTAL MANAGEMENT (4). Interdisciplinary group project. Analysis of a current environmental management problem. Topic changes each year. Three lecture hours and one laboratory hour per week. Spring. Staff.

890 [200] PROBLEMS IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1 or more). Departmental permission required. For students outside the department who wish to undertake individual study of a specific problem in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each individual instance. One or more hours per week. Fall, spring and summer. Staff.

892 [353] PH.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (PLAN 892, PLCY 892) (1). Prerequisites, doctoral standing and permission of the instructor. PhD. seminar on theory, methods, and current research and literature in environmental management and policy. One to two seminar hours per week. Fall or spring. (On demand.) Andrews.

899 [300] SEMINAR IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1 or more). Prerequisite, permission of the instructor for nonmajors. Readings and discussions to provide opportunity to develop new concepts and topics in various aspects of environmental sciences and engineering. Fall, spring and summer. Staff.

991 [391] RESEARCH IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1–9). Prerequisites, consultation with the faculty and approval of subject and proposed program and permission of the instructor. May be repeated. Hours and credits to be arranged. Fall, spring and summer. Staff.

992 [392] MASTER'S TECHNICAL REPORT (3–6). The technical report requirement for M.S.P.H., M.P.H., and M.S.E.E. candidates is satisfied by the extensive study of a problem in environmental sciences and engineering. Fall, spring and summer. Staff.

993 [393] MASTER'S THESIS (3–9). Fall, spring and summer. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Fall, spring and summer. Staff.

Department of Epidemiology (EPID)

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ANDREW F. OLSHAN, *Chair*

Professors

Ralph S. Baric (142) Public Health Virology, Molecular Virology
Myron "Mike" Cohen, Infectious Disease Epidemiology
Marilie D. Gammon (195) Cancer Epidemiology
Gerardo Heiss (41) Cardiovascular Epidemiology
David M. Margolis (220) Infectious Disease Epidemiology
Steven R. Meshnick (200) Infectious Disease Epidemiology
Robert C. Millikan (166) Cancer Epidemiology
Andrew F. Olshan (147) Cancer Epidemiology, Reproductive/Perinatal Epidemiology
Wayne D. Rosamond (162) Cardiovascular Epidemiology
Robert S. Sandler (73) Cancer Epidemiology
H. June Stevens (172) Nutritional Epidemiology, Obesity Epidemiology
David J. Weber (96) Infectious Disease Epidemiology

Associate Professors

Wilfrida Behets (210) Infectious Disease Epidemiology
Stephen R. Cole (224) Methodology, Infectious Disease Epidemiology
Giselle Corbie-Smith, Women's Health
James E. Hall (143) Host-Parasite Metabolism, Biological Chemistry
Jay S. Kaufman (194) Social Epidemiology, Chronic Disease Epidemiology, Methodology
Stephen W. Marshall (199) Injury Epidemiology, Methodology
William C. Miller (191) Infectious Disease and Clinical Epidemiology
Kari North (205) Cardiovascular Epidemiology, Genetic Epidemiology
Charles L. Poole (193) Methodology
Victor J. Schoenbach (64) Behavioral Epidemiology, Infectious Diseases Epidemiology (primarily STDs), Cancer Control (primarily Smoking Cessation)
Anna Maria Siega-Riz (218) Nutritional Epidemiology, Reproductive/Perinatal/Pediatric Epidemiology
Lola V. Stamm (145) Public Health Bacteriology, Molecular Cloning, Pathogenics of Infectious Disease
Til Hans Robert Stürmer (225) Pharmacoepidemiology, Methodology
James C. Thomas (127) Infectious Disease Epidemiology
Annelies Van Rie (202) Infectious Disease Epidemiology

Steven B. Wing (99) Cardiovascular Epidemiology, Occupational/Environmental Epidemiology

Assistant Professors

Jiu-Chiuan Chen (214) Environmental Epidemiology, Occupational Epidemiology, Cardiovascular Epidemiology
Julie Daniels (206) Environmental Epidemiology, Reproductive/Perinatal/Pediatric Epidemiology
Ka He (222) Nutritional Epidemiology
Audrey Pettifor (215) Infectious Disease Epidemiology
David B. Richardson (213) Environmental Epidemiology, Occupational Epidemiology
Jessie A. Satia (219) Nutritional Epidemiology, Cancer Epidemiology
Jane C. Schroeder (203) Cancer Epidemiology, Environmental Epidemiology, Genetic Epidemiology
Melissa A. Troester (226) Cancer Epidemiology
Research Associate Professor
Kelly R. Evenson (209) Cardiovascular Epidemiology, Physical Activity

Research Assistant Professors

Jennette Bensen, Cancer Epidemiology, Molecular Epidemiology
Carri Casteel, Injury Epidemiology
Kathleen C. Dorsey, Cancer Epidemiology
Nora Franceschini, Cardiovascular Epidemiology
Sara Huston, Cardiovascular Epidemiology
Debra E. Irwin (176) Cancer Epidemiology, Reproductive Epidemiology
Michele Jönsson Funk (216) Infectious Disease Epidemiology, Pharmacoepidemiology
Pia MacDonald, Infectious Disease Epidemiology
Sonia Napravnik (223) Infectious Disease Epidemiology
Kathryn M. Rose, Cardiovascular Epidemiology, Women's Health
Jennifer S. Smith (212) Infectious Disease Epidemiology
Andres Villaveces, Injury Epidemiology
Anissa Vines, Social Epidemiology, Health Care Epidemiology
Sharon S. Weir, Infectious Disease Epidemiology
Eric A. Whitsel (221) Cardiovascular Epidemiology
Karin Yeatts, Environmental Epidemiology

Research Instructors

Steven Callens, Infectious Disease Epidemiology
Abigail Norris Turner, Infectious Disease Epidemiology

Clinical Professors

Timothy S. Carey (138) Clinical Epidemiology
David F. Ransohoff (160) Health Care Epidemiology
Desmond K. Runyan (88) Clinical Epidemiology/Pediatrics
Ross J. Simpson Jr., Cardiovascular Epidemiology, Health Care Epidemiology
Ronald P. Strauss (182) Oral Epidemiology
Edward H. Wagner (15) Clinical Epidemiology, Health Services Research

Clinical Associate Professors

Lorraine Alexander, Public Health Preparedness, Distance Education
Bonnie Rogers (187) Occupational Epidemiology

Adjunct Professors

Naomar Almeido-Filho, Psychosocial Epidemiology
Edward Baker Jr., Occupational Epidemiology, Environmental Epidemiology
James D. Beck (167) Dental Epidemiology
Douglas Bell, Cancer Epidemiology
Dan German Blazer (108) Psychosocial and Aging Epidemiology
Gregory L. Burke, Cardiovascular Epidemiology
Willard Cates (188) Reproductive and Infectious Disease Epidemiology
Dennis A. Clements (152) Infectious Disease Epidemiology
Joseph Cook, Infectious Disease Epidemiology, Parasitology
Joan Cornoni-Huntley (04) Aging, Physical, Cognitive, and Social Functioning
John Dement, Environmental Epidemiology, Occupational Epidemiology
Robert Desowitz, Infectious Disease Epidemiology
Jeffrey Engel, Infectious Disease Epidemiology
Robert Fletcher (45) Health Care Epidemiology
Suzanne Fletcher (46) Health Care Epidemiology
Judith A. Fortney (116) Reproductive Epidemiology
Jean G. French (129) Environmental Epidemiology, Occupational Epidemiology
Joanne M. Garrett (156) Health Services Research
Paul A. Godley (181) Cancer Epidemiology
Lowell Goldsmith, Genetic Epidemiology, Chronic Disease Epidemiology
Raymond S. Greenberg (86) Cancer Epidemiology
Russell P. Harris (125) Cancer Epidemiology, Clinical Epidemiology
Sherman A. James (07) Psychosocial Epidemiology, Cardiovascular Epidemiology
C. David Jenkins, Social Epidemiology
Oscar Kashala, Global Health
Ulrich Keil (169) Cardiovascular Epidemiology, Occupational Epidemiology
Stephen Kritchevsky, Aging Epidemiology
Jay Levine, Veterinary Epidemiology
Stephanie London, Cancer Epidemiology
Matthew Longnecker, Environmental and Occupational Epidemiology
Dana P. Loomis, Environmental and Occupational Epidemiology
Melinda S. Meade (58) Medical Geography
Kenneth A. Mundt, Occupational Epidemiology
David Peden, Environmental and Occupational Epidemiology
Miquel Porta, Cancer Epidemiology, Clinical Epidemiology, Pharmacoepidemiology
Walter J. Rogan (39) Environmental Epidemiology
Michael Rosenberg, Reproductive Epidemiology
Carol W. Runyan (154) Injury Control
Dale Sandler (90) Environmental Epidemiology
David A. Savitz (101) Reproductive Epidemiology
Ilene C. Siegler (148) Aging
Philip D. Sloane (131) Aging
John W. Stamm (92) Dental Epidemiology
Patrick F. Sullivan, Genetic Epidemiology
Steven Teutsch, Chronic and Infectious Disease Epidemiology
John Thorpe Jr., Reproductive Epidemiology
Hugh H. Tilson (87) Pharmacoepidemiology
Clarice Weinberg, Environmental and Reproductive Epidemiology
Allen J. Wilcox (61) Reproductive Epidemiology
Redford Williams (141) Cardiovascular Epidemiology
Bonnie C. Yankaskas (82) Diagnostic Radiology/Cancer Epidemiology

Adjunct Associate Professors

Adaora Adimora, Infectious Diseases Epidemiology
Elizabeth B. Andrews (140) Pharmacoepidemiology
Donna D. Baird (104) Reproductive Epidemiology
John Barefoot (151) Cardiovascular Epidemiology, Psychosocial Epidemiology
Leigh Callahan, Chronic Disease Epidemiology, Health Care Epidemiology
Daniel J. Caplan (211) Oral Epidemiology
Joe Steven Cline, Infectious Disease Epidemiology, Environmental Epidemiology, Occupational Epidemiology
Thomas B. Cole (128) Injury Epidemiology
Glinda S. Cooper (196) Chronic Disease Epidemiology, Reproductive Epidemiology
Martin Crane, Chronic Disease Epidemiology, Reproductive Epidemiology
Nancy Dole, Reproductive Epidemiology
Bruce Duncan, Cardiovascular Epidemiology
Michael Emch, Spatial Analysis, GIS
Sara Ephross, Chronic Disease Epidemiology
Paul J. Feldblum (186) Infectious Disease Epidemiology
Bradley N. Gaynes, Psychiatric Epidemiology
Debbie Gipson, Health Care Epidemiology
Cynthia Girman, Pharmacoepidemiology

Laura Hanson, Geriatrics
Katherine E. Hartmann (196) Reproductive Epidemiology, Women's Health
Joanne Jordan, Chronic Disease Epidemiology
James Kirkpatrick, Infectious Disease Epidemiology
Peter Leone, Infectious Disease Epidemiology
Hester Lipscomb, Environmental and Occupational Epidemiology
Margaret F. McCann (100) Reproductive Epidemiology
William F. McDonnell III (170) Environmental Epidemiology
Patricia Moorman, Cancer Epidemiology
Dexter L. Morris (113) Cancer Epidemiology
Evan Myers, Health Care Epidemiology
Lucas Neas, Environmental Epidemiology
Warren P. Newton, Health Care Epidemiology
Joellen M. Schildkraut (126) Cancer Epidemiology
Maria Schmidt, Chronic Disease Epidemiology
Arlene Sena-Soberano, Infectious Disease Epidemiology
Nicholas Shaheen, Health Care Epidemiology
Betsy Sleath, Health Care Epidemiology
C. Gregory Smith (83) Environmental and Occupational Epidemiology
David C. Sokal (178) Reproductive Epidemiology
Paul E. Stang (163) Chronic Disease Epidemiology
Jack Taylor, Environmental and Occupational Epidemiology
Suzanne West (207) Health Care Epidemiology, Pharmacoepidemiology
Alice D. White (117) Cardiovascular Epidemiology
Timothy C. Wilcosky (98) Cancer Epidemiology
David Wohl, Infectious Disease Epidemiology
Sheryl Zimmerman, Aging

Adjunct Assistant Professors

Mary Anthony, Nutritional Epidemiology
Rukmini B. Balu, Infectious Diseases, Reproductive Epidemiology
Jane H. Brice, Clinical Epidemiology, Cardiovascular Epidemiology
Lori Carter Edwards (192) Cardiovascular Epidemiology
Patricia Chang, Cardiovascular Epidemiology
Honglei Chen, Nutritional Epidemiology
Remy Coeytaux, Health Care Epidemiology
Kourtney Davis, Pharmacoepidemiology
Jane Hoppin, Environmental Epidemiology
Esther C. Janowsky, Cancer Epidemiology
Dionne G. Law, Reproductive Epidemiology, Infectious Disease Epidemiology
Duanping Liao (189) Cardiovascular Epidemiology
William C. Maier, Pharmacoepidemiology
Mark Massing, Cardiovascular Epidemiology
Ann M. McNeill, Cardiovascular Epidemiology
David Miller, Pharmacoepidemiology, Molecular Epidemiology
Miriam Morey, Health Care Epidemiology, Aging Epidemiology
Edward L. (Lenn) Murrelle, Environmental Epidemiology, Genetic Epidemiology
Padmaja "Piku" Patnaik, Infectious Disease Epidemiology, International Health
Vilma Santana, Occupational Epidemiology
Williams Saunders, Psychosocial Epidemiology
Pamela Schwingl, Chronic Disease Epidemiology, Reproductive Epidemiology
Markus Steiner, Methodology
Timothy Wade, Environmentl Epidemiology
Emmanuel Walter, Infectious Disease Epidemiology
Christianna Williams, Aging
Rachel E. Williams, Health Care Epidemiology
Christopher Woods, Infectious Disease Epidemiology

Professors Emeriti

Barbara S. Hulka
Michel A. Ibrahim
Berton H. Kaplan
J. Richard Seed
Carl M. Shy

Courses

600 [160] PRINCIPLES OF EPIDEMIOLOGY (3). An introductory course that considers the meaning, scope and applications of epidemiology to public health practice and the uses of vital statistics data in the scientific appraisal of community health. One lecture and two lab hours per week. Fall and spring. Schoenbach, Alexander.

620I [604] AGING AND HEALTH (SOWO 604I, DENT 604I, PHCY 604I, NURS 782I, HMSC 904I, MEDI 604I, SOCI 824, PHYT 904I) (3). Introduction to normal aging, diseases of aging, mental health issues and the use of health services by older persons. Zimmerman.

689 [101R] RESOURCES FOR INTERNATIONAL STUDENTS (1). Structured opportunities for international students to become informed about U.S. academic and cultural issues as they pertain to their training in epidemiology. Not for degree credit. Fall.

690 [140, 141] PROBLEMS IN EPIDEMIOLOGY (1–21). A course for students who wish to make an intensive study of some special problems in epidemiology. Two or more hours a week. Fall, spring and summer. Staff.

700 [150] SAS AND DATA MANAGEMENT (3). An introduction to statistical analysis, programming and data management, using the SAS programming language. Two lecture hours and two lab hours per week. Fall.

705 [158] INTRODUCTION TO LOGIC AND PROBABILITY LOGIC IN EPIDEMIOLOGY (2). Corequisite, EPID 710 or approved equivalent. Permission required for nonmajors. Covers valid and fallacious arguments, the probability calculus, interpretations of probability, probabilistic fallacies, applications of Bayes, theorem, and interpretation of P-values and confidence intervals in epidemiologic research. Fall. Poole.

710 [168] FUNDAMENTALS OF EPIDEMIOLOGY (4). Corequisite, BIOS 600. Permission required for nonmajors. An intensive introduction to epidemiological concepts and methods for students intending to engage in, collaborate in or interpret the results of epidemiologic studies. Some familiarity with biomedical concepts may be needed. An alternate to EPID 600 for satisfying the SPH core requirements. Three lecture and two seminar hours a week. Fall. Thomas.

711 [170] CLINICAL MEASUREMENT/EVALUATION (PUBH 760) (3). Prerequisite, epidemiology or health care and prevention major. An introduction to the fundamental concepts of epidemiology, including clinical epidemiology, for clinicians. Emphasis is on applications in clinical research and practice. Fall. Miller.

715 [268] THEORY AND QUANTITATIVE METHODS IN EPIDEMIOLOGY (5). Prerequisites, EPID 705 and EPID 710, BIOS 545, and competence in SAS or STATA. Permission required for nonmajors. An in-depth treatment of basic concepts and skills in epidemiologic research, including problem conceptualization, study design, research conduct, data analysis and interpretation. Four lecture and two laboratory hours per week. Spring. Poole, Schroeder.

718 [269] EPIDEMIOLOGIC ANALYSIS OF BINARY DATA (3). Prerequisite, EPID 715. Permission of the instructor required for nonmajors. Concepts and applications, including logistic regression, binomial regression, model building strategy, additive and multiplicative interaction and graphical exploration. Includes computer-based experience with real data. Two lecture hours and one lab hour per week. Fall.

719 [270] READINGS IN EPIDEMIOLOGIC MODELING (1). Corequisite, EPID 718. Permission of the instructor required for nonmajors. Students currently enrolled in EPID 718 may optionally register for this companion seminar. Additional readings in the philosophy and technique of epidemiologic modeling will be explored in greater depth. Fall. Kaufman.

722 [271] EPIDEMIOLOGIC ANALYSIS OF TIME-TO-EVENT DATA (3). Prerequisite, EPID 718. Permission of the instructor required for nonmajors. Concepts and applications in survival analysis and analysis of incidence rates. Topics include censoring, Kaplan-Meier analysis, proportional hazards regression, time-dependent exposures, Poisson regression, longitudinal data analysis and

missing data Three lecture hours per week. Spring. Marshall.

725 [200] RESEARCH PLANNING WORKSHOP (0.5). Prerequisite, second year Ph.D. student (majors only). This course is designed to guide students through the initial stage of formulating an epidemiologic research topic and plan, leading towards the development of a full research proposal. Spring. Gammon, Heiss, Meshnick.

726 [201] EPIDEMIOLOGIC RESEARCH METHODS (3). Prerequisites, EPID 715 and EPID 725, majors only, permission of the instructor if not in at least second year of doctoral program. A second-level course in the design and conduct of epidemiologic research. Each student will comprehensively address the conceptual and practical aspects of developing a high-quality, detailed research proposal. Spring. Gammon, Heiss, Meshnick.

730 [369] ADVANCED METHODS FOR EPIDEMIOLOGY (1). Prerequisites, EPID 715 and 718, and BIOS 545. A seminar for advanced students exploring methodological issues in epidemiology, including measurement error, missing data, intermediate variables, complex study designs, meta-analysis, splines and other topics. (On request.) Kaufman, Poole, Marshall.

733 [225] CLINICAL TRIALS IN EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology, introductory biostatistics. Systematic overview of principles in design, implementation and analysis of clinical trials. Emphasis on applications in chronic disease epidemiology. In-depth discussion of case examples from cardiovascular disease epidemiology emphasized. Three lecture hours a week. Spring.

735 [256] CARDIOVASCULAR DISEASE EPIDEMIOLOGY (3). Corequisites, introductory epidemiology and biostatistics. Review of the main causes of cardiovascular disease morbidity and mortality, and their population determinants. Topics include epidemiologic methods, risk factors, strategies for prevention and a student research project. Three lecture hours a week. Fall. Heiss.

737 [258] ADVANCED CARDIOVASCULAR DISEASE EPIDEMIOLOGY (3). Prerequisites, EPID 710 and 735, or permission of the instructor. Contemporary findings, methodological issues and research recommendations in cardiovascular epidemiology. Topics include risk factors, trends, interventions, and health care. Students critique research and participate in a field experience. (On request.) Rosamond.

743 [229] GENETIC EPIDEMIOLOGY: METHODS AND APPLICATIONS (3). Prerequisites, EPID 715 and BIOS 545 or permission of the instructor. Concepts and methods of genetic epidemiology relevant to the study of complex human diseases, including segregation analysis, linkage analysis and gene-environment interaction. Includes whole genome approaches, as well as nonhuman systems. Three lecture hours a week. (On request.) North.

745 [230] MOLECULAR TECHNIQUES FOR PUBLIC HEALTH RESEARCH (2). Prerequisites, undergraduate-level biology and genetic course(s). Theory and application of selected nucleic acid and protein based techniques for public health research, including topics of sample preparation, PCR, DNA sequencing, genotyping, microarrays, immunoblotting and immunohistochemistry. Two lecture hours per week. (On request.)

750 [213] FUNDAMENTALS OF PUBLIC HEALTH SURVEILLANCE (3). This course provides the conceptual foundations and practical skills for designing and implementing surveillance systems, for using surveillance data for the conduct and evaluation of public health programs and research. (On request.)

751 [215] EMERGING AND RE-EMERGING INFECTIOUS DISEASES (4). Basic principles of infectious diseases, focusing on emerging and re-emerging disease agents that affect public health. Includes an introduction to the biology of viruses, bacteria and eukaryotic parasites. Four lecture hours a week. Spring. Stamm, Baric, Seed.

752 [218] INTRODUCTION TO METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. Introduction to infectious disease epidemiology. Course focuses on methodology, public health concerns, patterns of transmission and "newly" discovered infections. Will focus on diseases in developed countries, especially the United States. Three lecture hours a week. Fall. Weber.

753 [220] PREVENTION AND CONTROL OF INFECTIOUS DISEASES AT THE LEVEL OF THE COMMUNITY (3). Primary focus at county/state level; surveillance/control of acute infectious diseases; public health vs. individual rights. Bridging epidemiological concepts with community activities and real world health department issues. Three lecture hours per week. (On request.) Leone.

754 [221] MATHEMATICAL MODELING OF INFECTIOUS DISEASES (3). Prerequisites, EPID 600 or equivalent. Introduction to basic methods for analysis and interpretation of epidemiological data on infectious diseases, and for predicting the impact of control programs such as HIV prevention programs and vaccination strategies. Two lecture hours and two lab hours per week. (On request.) Van Rie.

756 [226] CONTROL OF INFECTIOUS DISEASES IN DEVELOPING COUNTRIES (3). Prerequisite, EPID 600. Epidemiology and control of selected infectious diseases prevalent in developing countries. Course involves lectures, critical discussions of published articles and a final group project. Three lecture hours per week. (On request.) Meshnick.

757 [227] EPIDEMIOLOGY OF HIV/AIDS IN DEVELOPING COUNTRIES (3). Prerequisite, EPID 600. This course examines the epidemiology of AIDS from an international perspective. It considers the AIDS pandemic in a broad epidemiologic perspective, including key aspects of basic, clinical and social science. Three lecture hours per week. (On request.) Behets, Weir.

758 METHODS AND PRINCIPLES OF APPLIED INFECTIOUS DISEASE EPIDEMIOLOGY (3). Prerequisite, EPID 600. This course will cover the interaction between an infectious agent, host and environment; modes and dynamics of transmission; the role of immunity in infectious disease epidemiology; and disease elimination strategies. Three lecture hours per week.

759 [223] METHODS IN FIELD EPIDEMIOLOGY (3). Course will focus on epidemiological methods required to investigate urgent public health problems. Course covers the skills and tools needed to conduct outbreak investigations and communicate findings to the public. Three lecture hours per week.

764 [380] HOSPITAL EPIDEMIOLOGY (1–2). Prerequisites, EPID 710 and EPID 752. Permission of the instructor required. Comprehensive seminar in hospital infection control. Topics include issues in employee health, surveillance, outbreak investigation, environmental sampling and policy formation. May be repeated for credit. Two to four seminar hours. Spring, summer. Weber.

765 [232] METHODS AND ISSUES IN PHARMACOEPIDEMIOLOGY (3). Prerequisites, introductory-level epidemiology and biostatistics. Application of the epidemiologic knowledge, methodology and reasoning to the study of the effects (beneficial and adverse) and uses of drugs in human populations. (On request.)

770 [233] CANCER EPIDEMIOLOGY AND PATHOGENESIS (3). Prerequisite, EPID 710 or equivalent, BIOS 600, undergraduate major or strong preparation in the biological sciences. Permission of the instructor required for nonmajors. Emphasis on integration of epidemiologic data with laboratory and clinical research findings. Issues in epidemiologic research design, analysis and interpretation are presented within the context of substantive epidemiology. Three lecture hours a week. (On request.) Schroeder.

771 [234] CANCER EPIDEMIOLOGY METHODS (3). Cancer statistics, lead time/length time bias, screening, causation, multistage models, study designs. Applications include cancer and infectious disease, risk assessment, genetic and molecular epidemiology of cancer, and public policy issues. Three lecture hours per week. (On request.) Millikan.

772 [290] CANCER PREVENTION AND CONTROL SEMINAR (HPAA 765, HBHE 765) (3). Permission required for nongraduate students. An interdisciplinary overview of cancer prevention and control. Emphasis on projects and activities from perspectives of epidemiology, health behavior and education, and health policy and administration. Appropriate research design and methodologies

will be covered. Fall. O'Malley.

775 [335] ADVANCED CANCER EPIDEMIOLOGY: CLASSIC AND CONTEMPORARY CONTROVERSIES IN CANCER CAUSATION (2). Prerequisites, EPID 715 and 718 and EPID 770 or 771. Permission of the instructor required. Readings and discussions on classic and contemporary controversies in cancer causation. Two seminar hours per week. (On request.) Gammon.

780 [276] OCCUPATIONAL EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. This course provides a background in the epidemiology of work-related illness and injury and the application of epidemiologic concepts and methods in protecting workers' health and safety. (On request.)

783 [125] INJURY AND VIOLENCE AS A PUBLIC HEALTH PROBLEM (MHCH 725, HBHE 725) (3). Prerequisite, EPID 600 or equivalent. Course considers causes and consequences of traumatic injury within developmental, socio-economic contexts and dilemmas in injury prevention. Injuries associated with transportation, violence and the home/occupational environments are included. Three lecture hours per week. Fall. Runyan and Kotch.

785 [277] ENVIRONMENTAL EPIDEMIOLOGY (3). Prerequisites, EPID 710 and BIOS 600. Epidemiologic ideas and methods applied to evaluation and control of human health consequences of environmental hazards. Pollution of environmental media and global change are considered from a human-ecological perspective, with local and international examples. Three lecture hours per week. (On request.) Chen.

786 [278] COMMUNITY-DRIVEN EPIDEMIOLOGY AND ENVIRONMENTAL JUSTICE (2). Principles for conducting research within communities unduly burdened by environmental health threats are presented. Topics include research ethics, community presentations, study design and implementation, and student research projects. (On request.) Wing.

800 [212] EPIDEMIOLOGY OF MEDICAL CARE (2). Prerequisite, EPID 600 or equivalent. Epidemiology applied to issues in health care, variations in disease and medical care, quality of care measures, role of health care in determination of trends, epidemiological approaches in planning/policy. Three lecture hours a week. (On request.)

801 [203] DATA ANALYSIS IN ORAL EPIDEMIOLOGY (2–3). Prerequisite, basic knowledge of SAS. Permission required. Data analysis project in oral epidemiology: data cleanup, file construction, analysis. For three credit hours, student also completes multivariate analysis with linear, logistic regression. Project to result in publishable paper. Two to three seminar hours a week. Fall.

805 [205] CLINICAL EPIDEMIOLOGY AND CLINICAL RESEARCH METHODS (4). Permission required. Intense interdisciplinary approach to clinical research, intended primarily for physicians committed to clinical investigation. Epidemiologic, social science and decision-analytic methods; medical ethics; health policy; health economics; medical care epidemiology. Five lecture and two seminar hours a week. Fall. Miller.

806 [206] CLINICAL RESEARCH SKILLS (4). Permission required. Practical research skills for clinical investigators, including grant application, instrument development, project management, data management, data analysis and the communication of research results. Four lecture hours a week. Spring. Garrett.

810 [254] PHYSICAL ACTIVITY EPIDEMIOLOGY AND PUBLIC HEALTH (NUTR 810) (3). Prerequisite, EPID 600 or equivalent. This course provides an overview of major issues in physical activity measurements, population distribution, correlates, impacts (physically and economically) and public health recommendations. Interventions, including relevant theories, will be reviewed. Three lecture hours per week. (On request.) Evenson, Ward.

813 [259] NUTRITIONAL EPIDEMIOLOGY (NUTR 813) (3). Prerequisites, EPID 600 or 710 and BIOS 600. This course builds the foundation for critical evaluation of the nutritional epidemiologic literature. Three lecture hours a week. Spring.

814 [261] OBESITY EPIDEMIOLOGY (NUTR 814) (3). Prerequisites, EPID 600 or 710 and BIOS 600. Examines epidemiologic research on the causes, consequences and prevention of obesity. Emphasis on methodologic issues pertinent to obesity research. Spring. Stevens.

815 [262] DIET AND CANCER (NUTR 815) (3). Prerequisites, EPID 600 or 710, BIOS 600, EPID 771 and NUTR/EPID 813. Examines and critically evaluates epidemiologic research on relationships of diet-related exposures with cancer etiology, prevention, and survivorship. Emphasis on skills for conducting, analyzing and interpreting diet and cancer epidemiologic studies. Spring.

818 [358] ADVANCED NUTRITIONAL EPIDEMIOLOGY (NUTR 818) (3). Prerequisites, BIOS 545, EPID 600 or 710, and NUTR/EPID 813 or permission of the instructor. Teaches skills and techniques required to study dietary exposures, anthropometric status and disease outcomes. Students will gain skills in analysis and interpretation of anthropometric data. Concepts and applications include quantification and measurement of dietary intake, use and management of nutrition monitoring data sets, application and interpretation of epidemiologic and statistical methods for the analysis of these data (such as linear and logistic regression), and appropriate use and interpretation of anthropometric indices. Three lecture hours per week. (On request.) Siega-Riz, Adair.

825 [280] SOCIAL DETERMINANTS OF HEALTH: THEORY, METHOD AND INTERVENTION (HBHE 802) (3). Prerequisites, EPID 600 and public health major. Discussion and readings will focus on population vs. international perspectives on health, risk condition vs. risk factors, concepts of causation, knowledge development as a historic and social process, and will examine macro-level determinants.

826 [228] SOCIAL EPIDEMIOLOGY: CONCEPTS AND MEASURES (3). Prerequisite, EPID 600. Social forces affecting community health and how to measure them for epidemiologic analysis. Topics range from social networks to racism and ethics. Three lecture hours per week. (On request.) Thomas.

851 [219] REPRODUCTIVE AND PERINATAL EPIDEMIOLOGY (MHCH 851) (3). Corequisites, EPID 600 and BIOS 600, or equivalents. Epidemiology of reproductive and perinatal health outcomes, including infertility, fetal loss, preterm birth, birthweight, congenital malformations and infant mortality. Includes current knowledge regarding epidemiology of these outcomes and discussion of methodologic issues. Three lecture hours per week. Fall. Daniels.

853 [350] ADVANCED TOPICS IN PERINATAL AND PEDIATRIC EPIDEMIOLOGY (MHCH 853) (2). Prerequisites, EPID 710 and EPID/MHCH 851. Permission of the instructor required for master's level students. Critical review of current topics in, and methods for, perinatal and pediatric epidemiology. Spring. Siega-Riz

880 [210] FOUNDATIONS OF PUBLIC HEALTH ETHICS (3). Basic ethical rationales underlying concerns central to public health. These include: ethical reasoning; concepts of justice; the influences of religion; principles of interacting with communities; professional conduct; and research ethics. (On request.) Thomas.

883 [257] TEACHING EXPERIENCE IN EPIDEMIOLOGY (1–4). Prerequisite, EPID major, second-year or above. Provides epidemiology majors with supervised experience in teaching and course preparation. Students act as assistants in departmental courses. Two to eight seminar hours a week. Fall and spring. Staff.

889 [300] TOPICS IN EPIDEMIOLOGY SEMINAR (1). Prerequisites, EPID 710 and EPID major. Topics are chosen to reflect emerging issues in the field, as well as those that meet the interests of the students and faculty in the department. (On request.)

890 [105] SEMINAR FOR MSPH STUDENTS (1). A workshop for addressing special topics related to M.S.P.H. program including, but not limited to, research topic development, career planning and public health ethics.(On request.) Wing, Daniels.

891 [390] EPIDEMIOLOGY DOCTORAL SEMINAR (2). Exposes students

to issues and debates in the philosophy of science, the object of knowledge in epidemiology, and the place of epidemiology in public health. Fall. Wing.

892 [306] INTERDISCIPLINARY SEMINAR IN HEALTH DISPARITIES (MHCH 892) (1). Prerequisite, MHCH 756. This seminar will provide an opportunity for students to synthesize knowledge across disciplines and to develop an interdisciplinary approach to addressing their identified health disparities research topic. One seminar hour per week.

893 [301] PHARMACOEPIDEMIOLOGY SEMINAR (1). Prerequisites, basic knowledge of epidemiology and biostatistics. This is a weekly seminar to explore current problems in pharmacoepidemiology. It supplements the introductory course, EPID 765. May be repeated. Two seminar hours a week. (On request.)

894 [302] INFECTIOUS DISEASE SEMINAR (1). Prerequisites, introductory epidemiology and biostatistics. Detailed review of selected topics in infectious disease epidemiology. May be repeated for credit.

895 [303] SEMINAR IN ORAL EPIDEMIOLOGY (1). Prerequisite, EPID 710. Explores conceptual and methods issues in conducting epidemiologic investigations of oral conditions, specifically caries, periodontal disease, and oral cancer (topics rotate semesters). Spring. Beck.

896 [305] SEMINAR IN CLINICAL RESEARCH (1). Prerequisite, CRC Fellow or permission of the instructor. Practical topics pertinent to clinical research will be presented by faculty on campus and from local industry. Fellows in the Clinical Research Curriculum will also present their work. (On request.) Miller.

897 [351] ADVANCED SEMINAR IN CARDIOVASCULAR RESEARCH (1–3). Permission required. Review of substantive and methodological research in cardiovascular and cerebrovascular diseases. May be repeated for credit. Two to six seminar hours a week. (On request.) Heiss.

898 GLOBAL HEALTH ETHICS SEMINAR (2). Prerequisite, basic knowledge of epidemiology or permission of instructor. This seminar aims to introduce students to the myriad of complex ethical issues that arise from health research, health policy and health care practice in both domestic and international contexts.

900 [315] STUDY IMPLEMENTATION IN EPIDEMIOLOGY (4). Designed to give epidemiology majors a supervised field experience in population health research. Fall, spring and summer. Faculty.

905L [359L] EPIDEMIOLOGY LABORATORY PRACTICE (1–9). Permission required. Students work individually with a faculty member on supervised laboratory research and skills development. May be repeated for credit. Two to 18 laboratory hours a week. Fall and spring.

910 [360, 361] RESEARCH IN EPIDEMIOLOGY (Var.). Prerequisite, permission of the instructor. Independent investigation in consultation with an instructor who must assign or approve the subject of research. Credits vary according to the effort and rigor of the research. Fall, spring and summer. Faculty.

992 [392] MASTER'S PAPER (3–6). Fall, spring and summer. Graduate faculty.

994 [394] DOCTORAL DISSERTATION (3–9) Fall, spring and summer. Graduate faculty.

Department of Health Behavior and Health Education (HBHE)

www.sph.unc.edu/hbhe
EDWIN FISHER, *Chair*

Professors

Brenda M. DeVellis (13) Health Education Theory, Patient Education
Jo Anne L. Earp (10) Health Education Evaluation, Women's Health, Cancer Control
Eugenia Eng (17) International Health, Community Health Education, Lay Health Advisor Interventions
Edwin Fisher (89) Diabetes, Community and Peer Interventions, Chronic Disease Management, Smoking and Smoking Cessation
Vangie Foshee (43) Dating Violence, Adolescent Health, Program Evaluation
Barbara Rimer (82) Cancer Control and Prevention, Tailored Print Communications
Carol Runyan (31) Injury Control, Violence Prevention, Worksite Injury Prevention
Allan Steckler (12) Qualitative Methods, Organizational Change, Native Americans

Associate Professors

Susan T. Ennett (45) Social Networks, Adolescent Health Risk Behaviors, Research Methods
Carol Golin (88) Adherence to Chronic Medical Therapy, Patient-Provider Communication, Medical Decision Making for HIV Therapy and Prevention
Laura Linnan (66) Applied Research in Worksites and Other Community-Based Settings, Multiple Risk Factor Behaviors, Organizational Change
Kurt Ribisl (64) Mass Media and Policy-Based Health Promotion Interventions, Tobacco Control

Assistant Professors

Noel Brewer (85) Biases in Health Decisions, Health Communication, Decision Making
Suzanne Maman (88) HIV/AIDS, International Health, Associations between HIV and Violence
Wizdom Powell-Hammond (92) Men's Health, Health Disparities, Social and Health Behavior Theory
Arjumand Siddiqi (93) Social Epidemiology, Children's Health and Development, Social Policy and Health
Deborah Tate (87) Obesity, Computer/Internet Interventions, Health Communication

Research Professor

Robert DeVellis (23) Research Methods, Health Behavior, Health Psychology

Research Associate Professors

James Michael Bowling (48) Injury Prevention, Statistics and Methods, Program Evaluation

Research Assistant Professors

Lynn H. Blanchard (51) Research around Public Service (including Community Partnerships and Collaborations), Program Evaluation, Service Learning
Carolyn Crump (49) Worksite Health Promotion and Evaluation, Program Planning, Management

Lecturers

Mary Altpeter (80) Health Promotion and Older Adults, Particularly Older Women; Community-Based Research and Health Promotion with Older Adults; Community-Based Research with Rural Populations
Sallie Benedict (56) Dissemination of Best Practices/Best Processes, Women's Health Promotion, Community-Based Participatory Research
Susan Blalock (39) Patient Education, Musculoskeletal Disorders, Medication Use
Linda Carl (60) Community-Based Interdisciplinary Education, Latino Language and Culture, Distance Education for Health Professionals, College Health
Tamera Coyne-Beasley, Injury and Violence Prevention, Adolescent Health and Risky Behaviors, Minority Health
Janet Dal Santo (86) Child Labor (Focus on International Child Labor), Childhood Injuries, International Health and Development
Mary Davis (78) Prevention Education, Program Evaluation, Program Planning
Robert Foss, Alcohol and Transportation-Related Injury, Adolescent Injury, Social Policy Approaches to Injury Prevention
Susan Gaylord (57) Alternative Therapies and Integrative Health Care, Aging, Health Beliefs and Care Pathways
Shelley Golden (87) Training and Facilitation, Health Communications, Population-Level Public Health Determinants and Health Policy

Alexis Moore, Community-Based and Rural Health Promotion, Lay Health Advisors, Breast and Cervical Cancer
Karen Strazza Moore, Community-Based Public Health, Community-Based Participatory Research, Minority Health, International Health
Carol Patterson, Obesity Prevention, Coping Mechanisms for Chronic Illness, Community Networking in Research Endeavors
Michael Pignone, Literacy and Health, Shared Decision Making, Colon Cancer Prevention
Julie Sweedler, Communications and Marketing, Women's Health, Program Planning
Karl Umble (90) Management and Leadership Development in Public Health, Continuing Professional Education and Training, Program Planning and Program Evaluation
Anna Waller (54) Injury Prevention and Control, Data System Users (Especially Database Design), Emergency Department Data and Surveillance

Adjunct Professors

Thomas Arcury (59) Health Disparities among Immigrant Communities, Rural and Minority Aging and Health, Environmental Health
Victor W. Marshall (81) Aging, Health Promotion, Work and Lifecourse
Michael Schulman (83) Occupational Injury; Injury Prevention and Control; Work, Violence and Health among Adolescents

Adjunct Associate Professors

Forrest Council (55) Injury Research Methods, Highway-Related Injury, Highway Injury Data
Christine Jackson, (42) Parenting and Family-Based Public Health, Health Communication, and Community-based Intervention
Isaac Lipkus (80) Theories of Health Behavior Change, Risk Communication, Medical Decision-Making
Colleen McBride (79) Genetic Risk Communication, Health Disparities, Behavior Change Interventions
Elizabeth Moracco (67) Women's Health, Violence against Women, Evaluation Research
Christopher Ringwalt (40) Drug Prevention, Survey Research, Program Evaluation
Celette Skinner (91) Cancer Screening, Cancer Genetics, Tailored Interventions
Jason Smith (68) Sexual and Reproductive Health, International Health, Turning Research into Practice

Adjunct Assistant Professors

Robert Flewelling (73) Substance Abuse Prevention, Community-Based Intervention, Adolescent Health Risk Behaviors
Alfredo Fort, Measurement of Primary Health Care Provider Performance, Facility and Community-Based Surveys, Program Evaluation
Moses Goldmon, Adolescent Health and Development, Leadership, Role of Faith in Promoting Health and Preventing Disease, Action Research in Ministry/Community-Based Participatory Research
Jennifer Griffith, Health/Patient Decision Making, Conjoint Analysis/Values Elicitation and Qualitative Methods in Health Services research
Anita Page Holmes, Lay Health Advisors, Minority Health, Access to Health Care, Church-Based Health Promotion
David Jolly (74) Tobacco, HIV/STDs, Health Policy
Linda Kinsinger (53) Behavioral Change for Weight Management, Behavioral Counseling Interventions in Primary Care Practice, Patient Education about Shared Decision Making
Megan Lewis (63) Social Relationships and Health, Cardiovascular Disease, Social Ecology
Kathleen MacQueen, Qualitative Research Methods and Approaches in Research Design, Ethics in Public Health and Research (including Applied Ethics Research), Social and Behavioral Dimensions of Clinical Trials Research (Especially HIV Prevention Trials)
David McCoy, Americans Indian Health, Health Care of Rural and Minority Populations, Budgetary and Policy Aspects of the Delivery of Health Care
Charles Morrison, HIV/STDs, Reproductive Health, Sexual and Drug Behavior, Contraception Research
Melva Okun, Tobacco Cessation, Nutrition, Physical Activity
Elizabeth Randall-David (70) Women's Health, Empowerment Education
LaHoma Romocki, Global Health, HIV/AIDS, Communications and Marketing, Health Disparities, Cancer Prevention, Adolescent Health
Anna Schenck, Health among the Elderly, Cancer Treatment and Outcomes, Cancer Screening
Miriam Settle, Career Development and Counseling, Internship Interests, Master's Thesis Advising
Sudha Shreeniwas, Aging and Health of Minorities in the U.S., Gender Violence in Asia and among Asian Immigrants in the U.S., Aging and Health Issues in South Asia
Paige Hall Smith (76) Violence against Women, Women's Health, Breastfeeding
Jane Vella (41) Dialogue Education, Patient Education, Evaluation
Yvonne Wasilewski, Asthma Management Intervention Research with Children and Adolescents, Violence Prevention Research with Adolescents, Peer-led Health Promotion and Disease Prevention Research

Adjunct Instructors

Mary Bobbitt-Cooke, Community Organization/Mobilization, Community Assessment, Policy Development and Advocacy
Tekola Fisseha, Communicable Diseases (i.e., HIV/AIDS/STDs), Lead Poisoning, Infant Mortality Reduction using the Perinatal Periods of Risk Approach
Bernard Glassman, Emerging Technologies for Health Communication, Communication about Emerging Health Technologies, Writing about Science for Results
Deborah Hilgenberg, Clinical Trials, Research Subject Protection, Data Collection
Kathleen Hoffman, Physician-Patient Communication in Malpractice/Negligence Prevention, Health Communication using Mass Media and New Targeted Communication Techniques, Cancer and Heart Disease Prevention
Vanessa Jeffries, Community-Based Public Health, Minority Health Issues, Evaluation
Dennis Joyner, Community Health Policy Development, Community Health Assessment, Program Planning and Implementation
Karen Monaco, Tobacco Control (Adult and Teen Smoking Cessation), Program Development, Training
Regina Petteway, Program Planning, Strategic Planning, Program Administration, Community Capacity Building, Working with Faith-Based Organizations
Kathryn Pollak, Patient-Physician Communication, Smoking Cessation, Health Disparities
Elizabeth Stern, Intimate Partner Violence, Training and Education, Latino Health, Sexual Violence
Katherine Turner, International Women's Health, Education and Training, Sexual and Reproductive Health Education and Counseling, Cultural Competency (especially on Lesbian, Gay, Bisexual and Transgender Health)
Gina Upchurch, Health Policy, Aging, Pharmaceutical Care
Karen Webb, Mental Health, Substance Abuse Prevention, Coalition-Building

Professors Emeriti

Harriet H. Barr, Clinical Associate Professor Emeritus
Karl Bauman, Professor Emeritus
John Hatch, Kenan Professor Emeritus
Ethel J. Jackson, Clinical Assistant Professor Emeritus
Elizabeth Mutran, Professor Emeritus
James R. Sorenson, Professor Emeritus

Courses

HBHE 296 [140] PROBLEMS IN HEALTH EDUCATION (1–6). A course for undergraduates who wish to do an independent study in the area of public health behavior and health education. To be arranged with faculty in HBHE.

HBHE 396 [141] PROBLEMS IN HEALTH EDUCATION (1–6). Advanced course for undergraduates who want to pursue a topic or research study in health behavior and health education. To be arranged with HBHE faculty.

HBHE 561 [196] MEDICAL REPORTING FOR ELECTRONIC MEDIA (HPAA 551) (3). Prerequisite, HBHE 660 or permission of the instructor. Teaches students how to conceive, script, report and produce medical stories for electronic media, especially television. Students work in teams to produce projects for professional media outlets. Fall. Linden.

HBHE 562 [197] SCIENCE DOCUMENTARY TELEVISION (JOMC 562, HPAA 552) (3). Students learn skills needed to produce a science documentary for broadcast on television, including research and script writing. Spring. Linden.

HBHE 563 [160] INTRODUCTION TO WOMEN'S HEALTH AND HEALTH EDUCATION (WMST 563) (3). Using a lecture-discussion format, this course provides an overview of women's health-specific interests as family and community members, as patients, and as health professionals. Implications for health education practice as well as opportunities for future research are emphasized. Two lecture and two seminar hours per week. Offered every other fall. Staff.

HBHE 600 [131] SOCIAL AND BEHAVIORAL SCIENCES IN PUBLIC HEALTH (3). This course focuses on social and behavioral science theories, research and interventions aimed at promoting health of individuals, groups, communities and populations. Two lecture hours per week. Spring and summer. Golden.

HBHE 660 [195] MEDICAL JOURNALISM (JOMC 560, HPAA 550) (3). Prerequisite, JOMC 450 or permission of the instructor. Prepares students to work as medical journalists for a variety of media, including print, broadcast and the Internet. The course emphasizes writing skills and interpreting medical information for consumers. Fall. Linden.

HBHE 699 [142] SPECIAL TOPICS IN HEALTH BEHAVIOR AND HEALTH EDUCATION (1–6). An experimental course designed for faculty who wish to introduce a new course to the department. Fall, spring and summer.

HBHE 700 INTRODUCTION TO PUBLIC HEALTH AND PUBLIC HEALTH EDUCATION (2). This course offers an introduction to public health, a history of public health and public health education, and an overview of population health/social determinants of health. Fall. Staff.

HBHE 701 PROFESSIONAL DEVELOPMENT SERIES I (1). The first semester of this series will cover essential professional skills such as working with small groups and coalitions, presentations, working with the media (interviews, writing press releases), event planning. Fall. Staff

HBHE 702 PROFESSIONAL DEVELOPMENT SERIES II (1). The series will continue to cover essential professional skills such as working with small groups and coalitions, presentations, working with the media (interviews, writing press releases). Spring. Staff

HBHE 703 PROFESSIONAL DEVELOPMENT SERIES III (1). The second year of this series will cover a wide range of program management skills including budgeting, supervision, hiring and leadership style. Fall. Staff.

HBHE 704 PROFESSIONAL DEVELOPMENT SERIES IV (1). The second semester of year two of this series will continue to cover a wide range of program management skills including budgeting, supervision, hiring and leadership style. Spring. Staff.

HBHE 708 [208] LATINO HEALTH PROMOTION RESEARCH (3). An examination of social, political, geographic and psychological forces affecting the health of Latinos in the U.S. Discussion of theoretical and methodological issue relevant to U.S. Latino health promotion research to help prepare students to do research or work in the Latino community. Fall. Staff.

HBHE 709 [108] U.S. POPULATIONS OF COLOR (3). This course explores the various structural forces that impact the health status and health behaviors of populations of color in the United States. Spring. Staff.

HBHE 710 [210] COMMUNITY CAPACITY, COMPETENCE AND POWER (3). The nature and delineation of participatory action research and its relevance to concepts, principles and practices of community empowerment. Students learn methods (such as photovoice) through learning projects. Spring. Eng.

HBHE 715 COMMUNICATION FOR HEALTH-RELATED DECISION MAKING (1–3). Course provides foundation and skills to understand and improve decision making that affects people's health. It teaches theoretical basis and evidence-based applications of health-related decision making. Spring. Golin.

HBHE 725 [125] INJURY AS A PUBLIC HEALTH PROBLEM (MHCH 725, EPID 783) (3). Prerequisite, EPID 600 or equivalent. This course considers the causes and consequences of traumatic injury within developmental, social and economic contexts, and dilemma in injury prevention. Injuries associated with transportation, violence and the home and occupational environments are included. Three lecture hours per week. Fall. Runyan and Kotch.

HBHE 726 [189] ADOLESCENT HEALTH (3). This course covers the epidemiology, etiology and prevention of adolescent health risk behaviors including: substance use, violence and sexual behavior. Theories of adolescent behavior and methodological issues related to research on adolescents are also emphasized. Three lecture hours per week. Fall. Ennett.

HBHE 727 PATIENT ADVOCACY (3). Explore competing definitions of patient advocacy. Topics related to ethics, policy and law will be covered in the context of what have often been termed patient rights and responsibilities. Three lectures hours per week. Fall. Earp

HBHE 730 [130] THEORETICAL FOUNDATIONS OF BEHAVIOR AND SOCIA L SCIENCE (3). This course covers selected social and behavioral science theories and concepts that apply to the analysis of health-related behaviors and intervention strategies. Fall. Ribisl.

HBHE 731 [231] ANTHROPOLOGY AND PUBLIC HEALTH: CRITICAL PERSPECTIVES ON RESEARCH AND PRACTICE (2). The course is for students who want to gain critical tools designed to improve analytical policy and cultural skills. Public health topic areas include AIDS, global health, reproductive health, cancer, violence prevention and federal public health goals. Fall. Staff.

HBHE 733 [233] INTRODUCTION TO PROGRAM MANAGEMENT (3). An introductory overview of health education program management. A practical study of personnel and financial management issues including: staff development, recruitment, performance appraisal, budget preparation and monitoring. Three lecture hours per week. Fall. Crump.

HBHE 740 [240] MENTORED FIELD EXPERIENCE: ENGAGEMENT, ASSESSMENT AND INTERVENTION DEVELOPMENT (4). A year long mentored field experience where students partner with a defined community, organization or research team and establish a negotiated set of deliverables. Four lecture hours per week. Field fee: $600. Fall. Linnan.

HBHE 741 [241] MENTORED FIELD EXPERIENCE: INTERVENTION, IMPLEMENTATION, EVALUATION AND DISSEMINATION/SUSTAINABILITY (4). Prerequisite, HBHE 740. This course is the second semester of a year-long mentored field experience. The capstone will be conducted in modules, i.e., intervention, implementation, evaluation and dissemination/sustainability. Spring. Linnan.

HBHE 742 [242] PROGRAM INTERVENTION, IMPLEMENTATION AND MONITORING I (1–4). Prerequisite, HBHE 741. Methods for executing health education intervention plans, including monitoring effectiveness and making appropriate modifications. Students work under faculty advisors to collaborate with local agencies and implement the plan of action developed in HBHE 741. Fall. Eng.

HBHE 743 [243] PROGRAM INTERVENTION, IMPLEMENTATION AND MONITORING II (1–4). Prerequisite, HBHE 742. Application of methods to analyze and interpret data regarding the effectiveness of health education interventions. Students work under faculty advisors to assess the effectiveness of

interventions implementation in HBHE 742. Spring. Eng.

HBHE 744 [244] RESEARCH PRACTICUM I (1–4). Research option: Students must complete a mentored research practicum. The mentor and student will develop a contract to achieve their research objectives and the means of evaluating an intervention or testing a hypothesis. The practicum requires a total of 200 hours of work starting in the second year of the program. Summer. Foshee.

HBHE 745 [245] RESEARCH PRACTICUM II (1–4). Research option: After completing the data collection and analysis component of the practicum, students write up their findings into a publishable manuscript. Spring. Foshee.

HBHE 750 [250] APPLIED RESEARCH METHODS (3). Prerequisite for nonmajors, permission of the instructor. Research methods of relevance to planned change in health-related behavior and program planning. Research designs include quantitative and qualitative methods and focus on application to public health practice. Four lecture hours per week. Fall. Brewer.

HBHE 751 [251] THE ROLE OF EVALUATION IN HEALTH EDUCATION (2). Emphasis on methods to show the importance of evaluation in health education program planning and developing skills in formative evaluation design, emphasizing analysis that contributed to decision making regarding programs. Two lecture hours per week. Spring. Staff.

HBHE 752 [252] INTERVENTION METHODS IN HEALTH EDUCATION (4). Critical examination of major intervention methods used in health promotion and disease prevention programs, and ways to tailor these methods to different settings and populations in which health educators work. Four seminar hours per week. Spring. STAFF.

HBHE 753 [253] QUALITATIVE EVALUATION AND RESEARCH METHODS (NUTR 753) (3). Prerequisite, HBHE 750 or equivalent. Theoretical and methodological approaches of applied medical anthropology for health program development and evaluation. Field methods for collecting and analyzing data through observation, interviewing, group methods and case studies. Spring. Maman.

HBHE 755 [255] POPULAR AND EMPOWERMENT EDUCATION FOR HEALTH EDUCATORS (3). Explore empowerment education and popular learning methodologies within the context of health education, creating opportunities for dialogue between theory and practice. Examine adult learning theories, participatory learning concepts and community development techniques. Will also discuss issues of power between practitioners, health educators and the community. Fall. Randall-David.

HBHE 760 ADVANCED RESEARCH METHODS I (3). Fundamentals of research in health behavior and health education including conceptualization of research questions and hypotheses, measurement, sampling and observational research designs. Fall. Ennett.

HBHE 761 ADVANCED RESEARCH METHODS II (3). This course is a continuation of HBHE 760 and covers experimental research designs, evaluation research, introduction to qualitative methods and selected topics in statistical analysis. Spring. Foshee.

HBHE 765 [290] CANCER PREVENTION AND CONTROL SEMINAR (HPAA 765, EPID 772) (3). An interdisciplinary overview of cancer prevention and control. Emphasis on projects and activities from the perspectives of epidemiology, health behavior and education and health policy and administration. Appropriate research design and methodologies are covered. O'Malley.

HBHE 772 [172] PLANNING HEALTH PROMOTION IN COMMUNITY, WORKSITE, SCHOOL AND MEDICAL SETTINGS (3). Prerequisite, permission required for nonmajors. This course teaches how to use a comprehensive planning model to plan, implement and evaluate an evidence-based intervention to address a public health problem for a defined population. Spring. Moracco.

HBHE 795 [195] E-HEALTH (3). An overview of the positive and negative impacts of the Internet on public health. Covers research, evaluation sites, ethics and use of theory that addresses key public health problems. Fall. Ribisl.

HBHE 799 [200] SPECIAL STUDIES IN BEHAVIOR CHANGE (1–6). Experimental course to be offered by faculty to determine the need and demand for the subject. Topics will be chosen by faculty based on current public health issues. Fall, spring and summer. Staff.

HBHE 800 [300] SOCIAL PSYCHOLOGICAL THEORIES OF INDIVIDUAL HEALTH BEHAVIOR (3). Prerequisite, HBHE 730 or permission of the instructor. Selected social psychological theories and their relationship to health promotion, disease prevention and patient education. Three lecture hours per week. Spring. DeVellis.

HBHE 801 [301] TOPICS IN SOCIOLOGY OF HEALTH (3). Prerequisite, HBHE 600 or 730. Permission required for nonmajors. Health issues will be analyzed using sociological approaches in order to determine research needs to develop more informed social policy. Implementation for practice will be discussed. Fall. (Alternate years.) Staff.

HBHE 802 [302] SOCIAL DETERMINANTS OF HEALTH: THEORY, METHOD AND INTERVENTION (3). Prerequisite, EPID 600. Discussion and readings will focus on population vs. individual perspectives on health, risk conditions vs. risk factors, concepts of causation and knowledge development as a historic and social process. Course will also examine macro-level determinants of population health. Fall. Staff.

HBHE 803 [303] SOCIAL RELATIONSHIPS AND HEALTH (3). Prerequisite, EPID 600 or equivalent. Introduces student to epidemiological evidence that links social relationship with health outcomes; theoretical and empirical work that attempts to link the association between social relationships and physical health. Spring. Lewis.

HBHE 810 [310] DOCTORAL SEMINAR: HISTORICAL AND CONCEPTUAL BASES OF PUBLIC HEALTH (3). This seminar examines the historical and conceptual bases of public health and health education and considers ideological and ethical implications for public health research, policy and programs. Fall. Three lecture hours per week. Runyan.

HBHE 811 [311] DOCTORAL SEMINAR: DEVELOPMENT OF HEALTH PROMOTION AND DISEASE PREVENTION INTERVENTION (3). The goals of this seminar are to explore the problems and issues in using behavioral and social science theories, concepts and data to inform HBHE research and interventions. Fall. Three lecture hours per week. Tate.

HBHE 812 [312] DOCTORAL SEMINAR: PROFESSIONAL ISSUES (3). Topics related to optimal functioning as a doctorally prepared professional, including writing and reviewing grants, manuscripts, abstracts, consulting; credentialing; teaching; job search; ethics, collaboration, fraud and politics in research. Three lecture hours per week. Fall and spring. Staff.

HBHE 813 [313] DOCTORAL SEMINAR: MODELS OF HEALTH EDUCATION AND PRACTICE (3). The purpose of this seminar is to describe, critically analyze and compare a variety of health education practice models (e.g., social change model, PRECEDE/PROCEED stage model of diffusion and others). Three lecture hours per week. Fall and spring. Staff.

HBHE 815 FOUNDATIONS OF HEALTH BEHVIOR AND HEALTH EDUCATION I (3). A critical examination of the conceptual and empirical bases of public health and health education, social determinants of populaiton health, health disparities and issues around social justice. Fall. Runyan and Siddiqi.

HBHE 816 FOUNDATIONS OF HEALTH BEHAVIOR AND HEALTH EDUCATION II (3). A critical examination of globalization and health, principles of individual and collective behavior and behavior change and the role of health behavior and health education in emerging public health issues. Fall. Maman and Powell-Hammond.

HBHE 825 [225] SEMINAR IN INTERDISCIPLINARY HEALTH COMMUNICATION (3). Prerequisite, HBHE 730. Permission required for nonmajors. Interdisciplinary overview of communication theory and research and critical analysis of applications of theory to interventions using communication for health.Three hours per week. Fall. Staff.

HBHE 840 [340], 841 [341] ADVANCED FIELD TRAINING IN HEALTH EDUCATION (1–3). Open to doctoral students in the department. Under guidance by faculty and field counselors, students assume major responsibility for planning, executing and evaluating community health education projects. Field fee: $125. Fall and spring. Staff.

HBHE 842 [317] PRIMARY PRACTICUM FOR DOCTORAL STUDENTS (1–4). Practicum is designed to enhance knowledge and skills in teaching. Student must be involved in teaching a two or three credit course. Co-teaching a course may satisfy this requirement. Fall, spring and summer. Staff.

HBHE 843 [342] SECONDARY PRACTICUM FOR DOCTORAL STUDENTS (1–4). The intervention must provide a senior role in a health intervention and have a research or evaluation component. Fall, spring and summer. Staff.

HBHE 844 [343] RESEARCH PRACTICUM FOR DOCTORAL STUDENTS (1–4). Designed to fulfill the research practicum for doctoral students, which may involve designing and implementing a research project, carrying out data analyses, writing manuscripts or assuming responsibility for a project. Fall, spring and summer. Staff.

HBHE 850 RESEARCH MANUSCRIPT DEVELOPMENT (3). Prerequisite, HBHE 751 or HBHE 860. This seminar is designed to help advanced students refine conceptual and writing skills essential to the production of a manuscript based on already collected qualitative and quantitative data. Three hours per week. Spring. Earp.

HBHE 851 [351] CAUSAL MODELING AND STRUCTURAL EQUATIONS (3). Prerequisites, BIOS 545 or equivalent, and permission of the instructor. This seminar is designed to refine a wide range of research skills in health behavior and health education by using data collected by others. Three seminar hours per week. Spring. (Alternate years.) Staff.

HBHE 852 [352] SCALE DEVELOPMENT METHODS (3). Prerequisites, HBHE 750 or equivalent, and permission of the instructor. Covers theory and application of scale development techniques for measuring latent constructs in health research; classical measurement theory and factor analytic methods are emphasized. Three seminar hours per week. Spring. R. DeVellis.

HBHE 853 [353] DOCTORAL SEMINAR: EVALUATION OF HEALTH PROMOTION AND DISEASE PREVENTION INTERVENTIONS (3). Prerequisite HBHE 811 or permission of the instructor. Emphasis on evaluation paradigms, quantitative and qualitative evaluation research methods, including methods for process, outcome and cost evaluation Three seminar hours per week. Fall. Ennett.

HBHE 860 [260] RESEARCH PROPOSAL DEVELOPMENT (3). Permission required for master's students and nonmajors. Integrate and apply detailed components of research methods to preparation and writing of a research grant proposal; become aware of proposal submission and review process for various funding agencies. Three lecture hours per week. Spring. Foshee.

HBHE 891 [201] SPECIAL STUDIES IN BEHAVIOR CHANGE (1–6). An independent course designed for study areas of natural or planned change; personal and nonpersonal methods, in health related fields. To be arranged with faculty in each case.

HBHE 892 [202] SPECIAL TOPICS IN PROGRAM DESIGN AND EVALUATION (1–6). Repeatable within degree (for six hours). An independent course of study designed for students who wish to pursue advanced studies in program design and evaluation. Prerequisite, to be arranged with the faculty in each case. Fall, spring and summer. Staff.

HBHE 893 [203] SPECIAL STUDIES IN BEHAVIOR CHANGE (1–6). An independent course of study for students who wish to pursue studies in social class and variations in planned change. To be arranged with faculty in each case. Fall, spring and summer. Staff.

HBHE 897 [204] ADVANCED TOPICS IN HEALTH BEHAVIOR HEALTH EDUCATION (1–6). For doctoral students who wish to pursue an independent study or research in a selected area. Student will work with a faculty member in designing the study. Fall, spring and summer. Staff.

HBHE 960 [603] PRINCIPLES AND PRACTICES OF ALTERNATIVE AND COMPLEMENTARY MEDICINE (3). Permission of the instructor required. This course is designed to introduce medical students and other health professionals to the underlying philosophies, practitioners, techniques and evidence of efficacy of alternative therapeutics currently in use in the U.S., including chiropractic, dietary, mind-body, acupuncture, homeopathy and healing. Fall. Gaylord.

HBHE 992 [392] MASTER'S PAPER (3–6). Fall, spring and summer. Staff.

HBHE 993 [393] MASTER'S THESIS (3–6). Fall, spring and summer. Staff.

HBHE 994 [394] DOCTORAL DISSERTATION (3–9). Fall, spring and summer. Staff.

Department of Health Policy and Administration (HPAA)

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PEGGY LEATT, *Chair*

Professors

Peggye Dilworth-Anderson (308)
Peggy Leatt (310) Organizational Strategy and Design, Health System Reform, Patient Safety
Joseph P. Morrissey (138) Health Services Research, Administrative Medicine, Community Mental Health
Thomas C. Ricketts (139) Rural Health Care, Primary Care, Regionalization of Services, Political Philosophy, Policy Implementation and Policy Development
William L. Roper (239) Outcomes Research, Health Policy, Managed Care
Richard Gary Rozier (29) Dental Public Health
Morris Weinberger (300) Quality Management, Health Outcomes Research, Health Services Research
William N. Zelman (62) Health Care Financial Management, Activity- Based Costing, Cost of Quality, Instructional Design, Quality Improvement

Associate Professors

Andrea K. Biddle (175) Health Care Access and Reform, Childhood Vaccination, Pharmaceutical Economics
Marisa E. Domino (279) Health Economics
Laurel A. Files (28) Organization Design and Change, Strategic Planning
Bruce J. Fried (172) Human Resources Management in Health Care, Mental Health Services Research, Health Services Management and Education, Canadian Health Systems
Shoou-Yih Daniel Lee (301) Medical Care Organization
George Pink (309) Integrated Health Care, Health Services Accounting and Finance, Financial Performance Measurement, Executive Compensation, Nursing Cost Analyses
Sally C. Stearns (150) Health Economics, Health Policy
Bryan J. Weiner (277) Organization and Management of Community Health Partnerships

Assistant Professors

Kristen Hassmiller Lich
Kristin Reiter
Rebecca Wells
Harsha Thirumurthy

Clinical Professors

Deborah E. Bender (163) International Health, Maternal and Child Health Services, Community-Based Health Program Planning
Carmen Hooker Buell (219) Urban Studies, Health Care Legislation, Health Care Data

Clinical Associate Professors

Edward F. Brooks (128) Research Management, Rural Health Care Delivery, Health Manpower
John Paul (320) Health Policy, Health Economics, Outcomes Related to Pharmaceutical Products
William Carpenter
Dean M. Harris (195) Health Law and Ethics for Health Administration
Pamela Silberman (249) Public Health Legal Issues
Margaret Thomas

Clinical Assistant Professors

Oscar R. Aylor (268) Health Care Administration Programs
Brian Goldstein (278)
Suzanne Havala Hobbs (330) Public Health Policy, Food and Nutrition Policy
Felicia Mebane (302) Media Communications of Health Policy, Health Policy-making, Public Opinion
James V. Porto (134) Management and Information Systems, Public Budgeting and Finance
J. Bennett Waters (334)

Research Professors

Edward L. Baker Jr.
Sheila Leatherman (286) Quality of Care, Health Systems Performance, International Health Policy

Research Associate Professor

Sandra Greene

Research Assistant Professors

Jessica Lee (312) Access to Care for Children, Evidence-Based Practice of Dentistry
Michelle Mayer (313) Access to Health Care for Children, Quality of Pediatric Care for CSHCNs, Underserved Pediatric Populations

Adjunct Professors

William K. Atkinson II (255) Health Care Administration
Thomas Bacon
Dan Beauchanys
Hayden B. Bosworth
Fred T. Brown Jr. (282) Managed Care Networks
William H. Campbell (206) Pharmacy Administration
Young Moon Chae
Margaret Dardess (314) Federal Government Affairs, Health Policy, Health Care Coalitions
Edward Dauer
John Peter Fiqueroa
Deborah A. Freund (75) Health Economics, Health Policy
Donald A. Holzworth
Barbara Mark (318)
Kenneth Rethmeier (303) Community Needs Assessment
Dennis A. Revicki (209) Quality of Life Measures in Pharmaceutical Economics Research
Lillian Ridky (322)
Hugh H. Tilson (81) Health and Human Services, Preventive Medicine
Judith Tintinalli (323)
James E. Veney (18) International Health, Research and Evaluation Methodology, Statistical Applications, Family Planning and Maternal and Child Health, Health Planning

Adjunct Associate Professors

Mary A. Beck (164) Health Care Administration
Steven A. Garfinkel (292) Health Services Research and Managed Health Care Plans
Paul Halverson (191) Managed Care, Executive Leadership, Public Health Practice
Matthew L. Maciejewski
Patricia MacTaggart (324)
Michael Markowitz
Michael S. O'Malley (235) Health Services/Oncology Research
Janet E. Porter
Pamela J. Pure
Arjun Rajaratnam (326)
Betsy L. Sleath (254) Pharmacy Administration
Steven G. Sloate (228) Health Policy and Administration
Wendee M. Wechsberg (291) Clinical Addiction and Drug Treatment, HIV Projects

Adjunct Assistant Professors

Carolyn Carpenter (329)
Kathleen Dalton (297) Health Care Financing, Health Services Research, Academic Medical Centers
Brian Goldstein (278) Health Care Financial Management
Susan L. Hogue (290) Health Outcomes Research
Frederick K. Homan (236) Health Policy and Administration
George L. Jackson
Steven G. Justus
Melissa Kaluzny (331)
Shalini L. Kulasingam
Michel D. Landry
Rebecca L. Mabe
Gary S. Nestler
David D. Potenziani (298) Management Information Systems in Health Care
Stuart M. Rennie
Richard P. Scoville (272) Management Information Systems in Health Care
Euichul Shin (328)
Karl E. Umble
Courtney H. Van Houtven (306) Informal Care and Elderly Health Care Use
Gary R. West
Christopher Woods

Adjunct Instructors

David A. Berqmire-Sweat
Dawn Carter (281) Strategic Planning and Marketing
Nelson Couch (299)
Wade G. Dehate
Randall J. Egseqian
Michael L. Freeman (265) Strategic Planning and Marketing
Noah D. Glick (238) Health Policy and Administration
Kay T. Grinnell
Nancy Henley (270) Quality Assurance and Managed Care
Jacqueline Horsley
Pamela Jenkins
Douglas A. Johnston (174) Health Law
Lawrence K. Mandelkehr (244) Database Design for Health Care
Donald R. Markle
Paul Morlock
Gary Palmer
Michael W. Pattusa
Robert M. Pattusa, Jr.
William F. Pilkington
Patricia M. Pozella
Erica D. Rentz
Craig Savage
William R. Service (247)
Robert Stevens (333)
Deborah Teasley (334)
Franklin Walker
Matthew Womble (336)

Adjunct Clinical Instructors

Gary S. Palmer (217) Health Services Administration, Managed Care

Lecturer
William B. Gentry (321)

Adjunct Lecturers
Rita T. Konetzka
Jay Levy
David Martinez
Sanford D. West

Professors Emeriti
James P. Dixon
Patricia Z. Fischer
William S. Flash
William T. Herzog
Sagar Jain
Arnold Kaluzny
Kerry Kilpatrick
Robert A. Loddengaard
Curtis P. McLaughlin
Harry T. Phillips
Morris Schaefer

The Department of Health Policy and Administration offers three master's degrees, two doctoral degrees and two graduate-level certificate programs:

Master of Public Health (M.P.H.) (Residential)

The M.P.H. is a professional degree intended for those students who hold a doctoral-level professional degree (J.D., M.D., D.D.S., etc.) or a Ph.D. Students gain a comprehensive understanding of public health philosophy, methods, and values and are provided with an orientation to management and policy-related careers in the health field. The degree is suitable for individuals who have an interest in either healthcare management or health policy.

Master of Healthcare Administration (M.H.A.)

The M.H.A. is a professional degree for students wishing to pursue management careers in health systems, hospitals, consulting firms, managed care organizations, insurance firms, medical group practices, government agencies and other healthcare settings. The M.H.A. degree is designed to provide strong preparation in the management disciplines, a comprehensive understanding of the healthcare sector and an opportunity to pursue an area of concentration.

Master of Science in Public Health (M.S.P.H.)

The M.S.P.H. is a professional degree designed to prepare students for careers in health policy analysis, planning, development, evaluation and advocacy at local, state, federal and international levels as well as in the private sector. Students obtain a comprehensive understanding of the healthcare system, master methods for the analysis of healthcare policy options and pursue an area of concentration.

The Executive Master's Program (Distance Education)

The Department of Health Policy and Administration provides graduate-level education to employed health professionals and healthcare administrators through its Executive Master's program. This national program provides master's degree study to full-time health professionals throughout the United States and beyond. This program comprises brief, but intensive sessions on the Chapel Hill campus, faculty-guided, Internet-based distance learning and, occasionally, limited credit transfer from approved programs at other universities.

Doctor of Philosophy (Ph.D.)

The Ph.D. program in Health Policy and Administration is designed to provide students with the competencies, academic foundation and research experience to become independent and creative health services/health policy researchers. All students take required courses in health services research, research design, quantitative methods and health policy. In addition, students develop expertise in a minor area. Current minors include decision sciences, economics, epidemiology, finance, political science/public policy development, quality and access, and sociology/organization studies. Students must pass a written comprehensive examination upon completion of course work, then present and defend a dissertation proposal and the final dissertation based on original research. The Ph.D. program is designed to be completed in four years.

Doctoral Program in Health Leadership (Dr.P.H.)

UNC's Doctoral Program in Health Policy and Administration—the world's first distance Dr.P.H. program—prepares mid-career professionals for senior-level positions in organizations working domestically and internationally to improve the public's health. The three-year, cohort-based distance program targets individuals working full-time with substantial leadership responsibilities in communities, organizations and institutions. Students must have a master's or a doctoral degree before matriculating into the Dr.P.H. With the exception of three short visits to Chapel Hill in each of years one and two, learning takes place in participants' homes and offices, away from the UNC campus. Students connect to the faculty and their peers mainly via computer, making substantial use of technology that allows students and faculty to share data and interact productively via live video and audio. The distance format allows working professionals to complete doctoral leadership training while continuing full-time employment, remaining in-country throughout the duration of their education.

Certificate Program in Community Preparedness and Disaster Management

The professional certificate program in Community Preparedness and Disaster Management is designed to provide community leaders in emergency services (fire, law enforcement, EMS, 911 communications), public health, emergency management, health services, veterinary services and all who prepare for and respond to disasters with the opportunity to enhance their knowledge of management systems used to combat natural and man-made disasters, including terrorism. Students may also receive facilitation towards completing their Certified Emergency Manager (CEM)® Credential.

Graduate Courses

404 [204] MANAGEMENT PRINCIPLES AND PRACTICES (3). Provides an overview of knowledge and skills required for effective health services management. Aimed primarily at individuals who plan on assuming management roles in health services and related fields. Summer and spring. Files, staff.

405 [221] ORGANIZATION AND ADMINISTRATION OF MULTIHOSPITAL SYSTEMS (3). Legal, financial and organizational issues of multihospital systems development and management. Summer and fall. Files, Crawford.

420 [135] COMMUNITY AND PUBLIC HEALTH SECURITY—DISASTERS, TERRORISM AND EMERGENCY MANAGEMENT (3). Permission of the instructor required. This course examines systems for emergency management at federal, state and local levels. The roles of emergency management, health services, and public health in disaster management are examined. Spring. Porto.

421 [136] COMMUNITY AND PUBLIC HEALTH DISASTERS—AGENTS OF ACTION AND PUBLIC HEALTH HAZARDS (3). Permission of the instructor required. This course covers biological, chemical, nuclear and environmental agents that threaten public health. Spring. Porto.

422 [137] EMERGENCY MANAGEMENT I (3). Permission of the instructor required. Introduction of analytical tools to assess, evaluate, map and investigate disasters (including biological outbreaks). These tools will be used to improve planning for disaster management. Fall. Porto.

423 [138] EMERGENCY MANAGEMENT II (3). Permission of the instructor required. Explores issues of preparedness, response, recovery, mitigation and research in disaster management. Students will participate in the development of a plan and a simulation to evaluate the plan. Fall. Porto.

435 [141] MARKETING FOR NOT-FOR-PROFIT ORGANIZATIONS (3). Permission of the instructor. Application of basic principles of marketing and marketing decision models to problems in health care and other not-for-profit organizations. Spring. Crawford.

440 [155] INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS IN HEALTH CARE (3). Conceptual and practical aspects in the analysis, development and utilization of computer-based information and control systems with emphasis on application to the health care environment. Spring. Potenziani, staff.

455 [124] LONG-TERM CARE AND AGING POLICY ISSUES (3). Long-term care and aging policy in the United States from the early 1960s through the late 1990s will be reviewed along with Medicare, Medicaid and public/private long-term policies.

456 [163] INTERMEDIATE LINEAR MODELS (3). Prerequisite, BIOS 662 or equivalent. Matrix-based treatment of regression, one-way and two-way ANOVA, and ANCOVA, emphasizing the general linear model and hypothesis, as well as diagnostics and model building. The course begins with a review of matrix algebra, and it concludes with some treatment of statistical power for the linear model and with binary response regression methods.

465 [125] MANAGED CARE, MARKET REFORM AND THE IMPACT ON VULNERABLE POPULATIONS (3). Students will gain an understanding of how the changes in the health care market affect care for underserved populations, and will develop strategies to ensure that the needs of these populations are met. Fall. Silberman.

466 [279] COMPETITION, REGULATION, AND INSURANCE (3). Examines alternative approaches to containing health care costs adapted by public and private payers. Spring. Biddle.

470 [144] STATISTICAL METHODS FOR HEALTH POLICY AND ADMINISTRATION (3). Introduction of linear model approach to the analysis of data in health care settings. Topics include probability distributions, estimation tests of hypotheses, methods in multiple regression and analysis of variance and covariance. Fall, spring and summer. Porto.

472 [245] PROGRAM EVALUATION (3). Concepts and methods of the program evaluation paradigm as applied in health administration. Spring. Ricketts, Umble.

480 [157] DATABASE DESIGN FOR HEALTH CARE APPLICATIONS (3). Hands on introduction to the design and implementation of relational databases for managing and analyzing health care data (using Microsoft Access). Spring. Mandelkehr.

496 [140] READINGS IN HEALTH POLICY AND ADMINISTRATION (1–3). Directed readings or research. Written reports are required. Staff.

510 [185] ETHICAL ISSUES IN HEALTH POLICY AND ADMINISTRATION (3). Introduction to ethical issues in HPAA including rationing, managed care, clinical research, organizational ethics and compliance programs, administrative ethics and bio-ethical issues such as assisted suicide.

520 [122] LONG-TERM CARE ADMINISTRATION I (3). Prerequisite, HPAA major. Introduction to administration of long- term care facilities. Evolution of long-term care and survey of the current field. Examination of state and national requirements.

521 [123] LONG-TERM CARE ADMINISTRATION II (3). Prerequisite, HPAA 520 or permission of the instructor. Nursing home care, organization monitoring, costs and financing. Exploration of trends and issues such as cost controls, productivity, quality assurance, medical staffing and organization.

530 [222] AMBULATORY CARE (3). Major policy issues in primary care and managed care. Emphasis on practice management, rate setting, contracting, utilization control and quality assurance as case issues for management.

531 [126] PHYSICIAN PRACTICE MANAGEMENT (3). Prerequisites, senior status and permission of the instructor. Course targets students interested in a health care career. Topics include structure of group practices, governance/ownership, risk management, malpractice, physician compensation, operational and financial management.

531 [126] PHYSICIAN PRACTICE MANAGEMENT (3). Prerequisites, senior status and permission of the instructor. Course targets students interested in a health care career. Topics include structure of group practices, governance/ownership, risk management, malpractice, physician compensation, operational and financial management. Spring. Walker.

532 [146] HEALTH CARE CONSULTING (3). This course will provide students with a working knowledge of the various forms of health care consulting, including internal consulting. Students will enhance their analytical, presentation, teamwork and project management skills. Open to graduate students and seniors. Fall. Thomas.

550 [195] MEDICAL JOURNALISM (HBHE 660) (JOMC 560) (3). Prepares students to work as medical journalists for a variety of media, including print, broadcast and the Internet. The course emphasizes writing skills and interpreting medical information for consumers. Fall. Linden.

551 [196] MEDICAL REPORTING FOR THE ELECTRONIC MEDIA (HBHE 561, JOMC 561) (3). Conceiving, scripting, reporting, producing and editing medical stories for the electronic media, especially television. Students work in teams to produce projects for professional media outlets. Fall. Linden.

552 [197] SCIENCE DOCUMENTARY TELEVISION (HBHE 562, JOMC 562) (3). Students learn skills needed to produce a science documentary for broadcast on television, including research and script writing. Spring. Linden.

560 [261] MEDIA AND HEALTH POLICY (3). Introduces students to news media organizations and their role in health policy development. Students will learn how to evaluate media content and strategies and to effectively communicate via mass media. Spring. Mebane.

561 [262] ADVANCED POLICY ANALYSIS FOR THE PUBLIC'S HEALTH (3). The purpose of the course is to develop an understanding of the values and beliefs that drive formal public policies in health. The readings will cover philosophies of justice, the role of government and individuals, and ways to reconcile the plurality of values that exists in the American policy as citizens seek or provide health care or manage the public's health. Spring. Ricketts.

564 [220] HEALTH CARE IN THE UNITED STATES: ADMINISTRATIVE AND POLICY ISSUES (3). Prerequisite, HPAA major. An overview of key health services issues including quality, access, financing, insurance, ethics and delivery systems, plus an introduction to health care policy and politics. Fall. Brooks.

600 [119] INTRODUCTION TO HEALTH POLICY AND ADMINISTRATION (3). Prerequisites, senior status and permission of the instructor; does not qualify as a core course or elective for HPAA undergraduate majors. Provides an overview of the United States health system, emphasizing role of policy development and administrative decision making through case examples. Fall and spring. Havala Hobbs.

601 [106] ISSUES IN HEALTH CARE (1). Lectures on current topics in

health care. Fall. Fried, Aylor.

602 [109] CONCURRENT PRACTICE (1–3). Permission of HPAA program director. Supervised activities in an approved health organization, to include one or more specific projects, approved by an HPAA faculty member and directed by an approved preceptor/mentor in the organization. Fall, spring and summer. Staff.

604 THEORY AND PRACTICE OF HEALTH POLICY AND ADMINISTRATION (3). Policy and management issues and ideals.

634 [134] PUBLIC HEALTH ISSUES IN COMMUNITY PREPAREDNESS AND DISASTER MANAGEMENT (PWAD 634) (3). Examines conventional public health constructs of community preparedness and disaster management. Includes a review of traditional and emerging literature. Emphasizes conceptual development and application of adaptive leadership strategies. Fall. Waters.

650 [128] PHARMACEUTICAL RESEARCH, DEVELOPMENT, AND MARKETING (DPOP 800) (3). Acquaints future regulators, policy analysts, and corporate managers with the internal and external environments influencing decision making and management in the discovery, development and marketing of pharmaceuticals. Fall. Staff.

652 [268] ECONOMIC EVALUATION OF HEALTH CARE TECHNOLOGY (DPOP 802) (3). Focus is on determination of costs and benefits associated with alternative resource allocation schemes. Crucial economic concepts (e.g., utility valuation of health states and marginal analysis) are presented. Fall. Rittenhouse.

653 [267] ECONOMICS AND BEHAVIOR OF THE INTERNATIONAL PHARMACEUTICAL INDUSTRY (DPOP 801) (3). Provides an economic perspective on such issues as industry structure, regulation, pricing, research and development, product innovation, patient policies and profitability. Spring. Shih.

660 [110] INTERNATIONAL AND COMPARATIVE HEALTH SYSTEMS (3). Methods of comparing health systems, examinations of related national health systems and analysis of related high prevalence health issues. Fall. Fried, Harris.

661 [210] MANAGEMENT OF FOREIGN AID IN HEALTH AND POPULATION (3). Examines selected policy and management issues in foreign assistance from the point of view of both the donors and the recipients. Spring. Staff.

662 [211] HEALTH AND POPULATION POLICY DEVELOPMENT AND IMPLEMENTATION (3). Selected methods for studying policy development process and converting a policy into an action plan.

663 [212] INTERNATIONAL COOPERATION IN HEALTH AND POPULATION (2). Roles, problems, and opportunities for different kinds of international organizations in health and population fields.

664 GLOBALIZATION AND HEALTH (MHCH 664) (3). Globalization—its economic, environmental, political, technological, institutional and sociocultural dimensions—historically and currently contributes to beneficial and adverse effects on population, community and family and individual health.

670 [244] SYSTEMS SIMULATION FOR HEALTH SERVICES (3). Course will prepare students to simulate health services using the MedModel simulation software. Basic concepts of discrete event simulation.

701 [201] PROFESSIONAL TRAINING I (1). Prerequisite, HPAA major. Supervised professional training (fee is $550). Fall. Fried.

702 [202] PROFESSIONAL TRAINING II (1). Prerequisite, HPAA major. Supervised professional training (fee is $500). Fall. Fried.

703 [203] PROFESSIONAL TRAINING III (Var.). Prerequisite, HPAA major. Supervised professional training (fee is $500). Spring. Fried.

704 [209] HEALTH POLICY AND ADMINISTRATION INTERNSHIP (Var.). Prerequisite, HPAA major. Supervised field experience in approved health agencies. (Internship fee: $450.) Summer. Staff.

710 [281] HEALTH LAW (3). An introduction to law and the legal system as it relates to the delivery and financing of health care. Fall. Harris.

711 [276] RESEARCH MANAGEMENT AND ETHICS IN HEALTH POLICY (1). This course is aimed at doctoral and M.S.P.H. students with interests in research management and ethics. Using cases and examples, the first part of the course focuses on major management and leadership issues, while the second part deals with ethically relevant matters such as whistle blowing, various publishing and authorship issues, conflict of interest and commitment, human subjects, plagiarism and fraud. Spring. Brooks.

715 [270] HEALTH ECONOMICS FOR POLICY AND ADMINISTRATION (3). Prerequisites, BIOS 600 and permission of the instructor for non-HPAA students. Provides training in the theory of health economics and applies this theory to important issues in health policy and administration. Spring. Norton.

715L [270L] MICROECONOMICS LAB (1). Corequisites, HPAA 715 and permission of the instructor for non-HPAA students. Applications of health economics theory to current health care policy. Fall. Stearns.

720 [230] MANAGEMENT OF HUMAN RESOURCES IN HEALTH ORGANIZATIONS (3). Prerequisite, HPAA 730 or permission of the instructor. Emphasis is on clarifying concepts of human resources management and identifying the importance of human resources in health organizations. Fall. Fried.

725 [240] HEALTH CARE STRATEGY AND MARKETING (3). This course introduces students to strategic planning and marketing as they apply to health services organizations. During the course, students will develop practical skills in strategic management, such as internal and external environmental assessment, competitor analysis and methods for evaluating strategic alternatives that can be used in different types of health care settings. The class will explore the leadership roles of governing boards, health care managers and clinicians in strategic management. Spring. Paul.

730 [130] LEADERSHIP AND MANAGEMENT OF HEALTH CARE ORGANIZATIONS (3). Overview of organizational theory and empirical findings appropriate to the design and behavior of health care organizations. Topics include the design of the organization, its performance and its relationship to the environment. Fall. Paul.

732 [233] MANAGEMENT OF ORGANIZATIONAL CHANGE (3). The objective of this course is to improve competence in analyzing health organizations and managing planned change. Summer. Staff.

735 [390] ADVANCED CONCEPTS AND APPLICATIONS IN HEALTH POLICY AND ADMINISTRATION (3). Corequisite, graduate standing in HPAA and completion of master's core. Integrating and building upon the HPAA master's core, this comprehensive course focuses on organization policy-making and administration from the perspective of the CEO and top management. Spring. Sloate, staff.

740 [250] INTRODUCTION TO HEALTH CARE FINANCIAL MANAGEMENT (3). Prerequisite for nonmajors, permission of the instructor. A broad introduction to financial concepts, issues, tools and vocabulary. Topics include financial statement analysis, working capital management, budgeting, cost finding and rate setting. Minimal accounting proficiency expected. Fall, spring and summer. Zelman, staff.

741 [251] MANAGEMENT ACCOUNTING FOR HEALTH ADMINISTRATORS (3). Prerequisite, HPAA 740 or permission of the instructor. Covers selected topics in managerial accounting applied to health care. It is intended to provide in-depth coverage of managerial topics introduced in HPAA 250. Spring. Zelman.

742 [252] HEALTH CARE FINANCE I (3). Prerequisite, HPAA 740. Topics include basic financial management concepts, capital acquisition, cost of capital and capital structure and capital allocation. Fall. Pink.

743 [253] HEALTH CARE FINANCE II (3). Prerequisite, HPAA 742. Topics include financial analysis and forecasting, working capital distributions to own-

ers, mergers, capitation and financial risk. Spring. Pink.

744 [350] MANAGERIAL TOPICS IN HEALTH CARE FINANCIAL MANAGEMENT (3). Prerequisite, HPAA 740 or permission of the instructor. Course brings together organizational, financial and marketing concepts. Master's students are required to apply concepts to an actual organization by developing a business/marketing plan. Fall. Zelman.

745 [351] TOPICS IN HEALTH CARE FINANCE (3). Prerequisite, HPAA 740 or permission of the instructor. Analysis of topics of current interest in financial management of health care organizations. May include project selection, endowment stewardship and access to capital. Spring. Staff.

750 [127] INTRODUCTION TO DENTAL PUBLIC HEALTH (3). Prerequisite, permission of the instructor. Survey of the theory and practice of dental public health, with an emphasis on basic knowledge and skills necessary for planning and evaluating dental public health programs. Fall. Rozier.

751 [227] DENTAL PUBLIC HEALTH PRACTICE (3). Prerequisite, permission of the instructor. Emphasis on knowledge of community measures for prevention and control of oral diseases, understanding the scientific basis for their use, and designing and evaluating prevention programs for a specific population. Spring and summer. Rozier.

752 [228] ORAL EPIDEMIOLOGY FOR HEALTH POLICY AND ADMINISTRATION (3). Prerequisite, HPAA 750, EPID 600 or permission of the instructor. Focuses on the epidemiology of oral diseases and the implications and uses of this knowledge for dental health policymaking and administration of dental programs. Spring. Rozier.

755 [260] INTRODUCTION TO HEALTH POLICY AND POLITICS (3). Prerequisite, HPAA 564 or permission of the instructor. This course addresses the major political institutions and policy processes that shape health policy, principally at the federal level. Spring. Mebane.

756 [306] SPECIAL PROBLEMS IN HPAA (3). Prerequisites, doctoral standing and permission of the instructor and the director of the doctoral program. Examination of special problems in health policy and health administration studies. Spring. Staff.

760 [120] HEALTHCARE QUALITY AND INFORMATION MANAGEMENT (1–3). Prerequisites, intermediate-level Spanish and permission of the instructor. Through presentations of issues related to access and quality, the course, which is presented in Spanish, introduces Spanish public health terminology. Fall. Bender.

761 [263] QUALITY AND UTILIZATION MANAGEMENT (3). Prerequisite, HPAA 564. Evolution and current status of health care quality management systems and programs for utilization control. Includes discussion of alternative quality assurance methods, hospital accreditation and government programs. Spring. Scoville.

762 [264] QUALITY OF CARE (3). Prerequisite, HPAA 564. Methods and practices for quality control and assurance in health care organizations. Spring. Weinberger.

763 [265] POLICY ISSUES IN HEALTH OUTCOMES AND QUALITY OF CARE (3). Systematic overview of the scope, history, evolution, measurement and policy considerations of quality of care and health outcomes. This course requires the development of rigorous analytical essays on aspects of outcomes and quality. Spring. Tolleson-Rinehart.

765 [290] CANCER PREVENTION AND CONTROL SEMINAR (EPID 772, HBHE 765) (3). An interdisciplinary overview of cancer prevention and control. Emphasis on projects and activities from perspectives of epidemiology, health behavior and education and health policy and administration. Appropriate research design and methodologies are covered. Fall. O'Malley.

770 [241] OPERATIONS RESEARCH FOR HEALTH CARE SYSTEMS (3). Prerequisites, BIOS 600 and permission of the instructor. Review of the systems analysis process in health care systems. Deterministic and random models, mathematical programming, queuing, simulation, forecasting and measurement. Emphasis on model formulation and computer solution of decision models. Spring and summer. Staff.

771 [271] STUDY DESIGN AND REGRESSION ANALYSIS (3). Prerequisites, BIOS 600 or equivalent, and permission of the instructor. The purpose of this course is to familiarize the student with the tools of policy analysis, and to provide hands-on experience in using quantitative policy tools. Spring. Biddle.

772 [272] METHODS FOR HEALTH POLICY ANALYSIS AND TECHNOLOGY ASSESSMENT (3). Prerequisite, permission of the instructor for nonmajors. Course covers basic methods used to identify policy issues, measure and value health outcomes, identify and estimate health resources and develop mathematical models to predict outcomes/costs using limited data. Fall. Biddle.

789 [391] MASTER'S PAPER DEVELOPMENT (2). Prerequisite, second-year M.S.P.H. or first-year M.P.H. students only. Broad topics related to the development and management of a research project are covered. The major goal is the development and completion of a proposal to be submitted for an independent master's paper. Fall. Stearns.

810 [377] LEADERSHIP IN HEALTH LAW AND ETHICS (2). Course is designed to provide learners with an introduction and overview of critical issues relating to law, ethics and public health. Havala Hobbs.

815 [278] GRADUATE HEALTH ECONOMICS SEMINAR (1). Permission of the instructor required. Discussion of recent papers in health economics. Students must have solid knowledge of graduate microeconomics theory and econometrics. Fall. Stearns.

820 [375] ORGANIZATIONAL LEADERSHIP THEORY AND PRACTICE (2). Focus is on the behavioral, power-influence, trait, and situational approaches to leadership. Addresses core leadership principles plus leadership-followership theory, transformational and strategic leadership and creating change. Fall. Brooks.

821 [381] LEADERSHIP IN HEALTH POLICY DEVELOPMENT (2). This course is the second in a series of executive Dr.P.H. leadership core courses. Guest discussants will introduce students to timely issues relating to health leadership in order to foster understanding and mastery of what successful top organizational leaders do to create change. Spring. Brooks, Havala Hobbs.

860 [376] POPULATION PERSPECTIVES FOR HEALTH (1). A review of how the population perspective is used to create programs and social change for health in the United States. Fall. Ricketts, staff.

870 [300] DOCTORAL SEMINAR IN HEALTH POLICY AND ADMINISTRATION I (3). Prerequisite, doctoral standing. Readings and discussion of various aspects of health services. Special emphasis is given to the interrelationships of administrative and organizational theory to selected health service topics. Fall. Lee.

871 [304] SEMINAR IN TEACHING HEALTH POLICY AND ADMINISTRATION (1). Problems and processes of teaching health policy and administration, including supervised practicum experience. Fall. Zelman.

872 [305] SELECTED TOPICS IN HEALTH POLICY AND ADMINISTRATION: ADVANCED SEMINAR (3). Prerequisite, permission of the instructor. Integrated study of selected theory and research as it relates to the organization and delivery of health services. Separate seminars are developed to correspond to the doctoral student's specific interests and needs. Spring. Morrissey.

873 [360] POLICY SEMINAR IN HEALTH POLICY AND ADMINISTRATION (1). Seminar on policy issues in health policy and administration. Fall and spring. Pink.

881 [274] LINEAR REGRESSION MODELS (SOCI 711) (3). Prerequisite, HPAA 882 or equivalent. This course is an introduction to the analysis of categorical data using maximum likelihood. Topics covered: econometric models in which the dependent variable is not continuous, including Logit, Probit, Tobit, two-part and duration models. Fall. Norton.

882 [273] ADVANCED METHODOLOGY IN HEALTH POLICY AND

ADMINISTRATION (SOCI 709) (3). Prerequisites, HPAA 796 (16) and HPAA 496 (28) or equivalent. This course is an introduction to linear regression models. Topics include linear algebra, least squares regression, multicollinearity, heteroscedasticity, autocorrelation and hypothesis testing. Fall. Norton, Domino.

883 [371] ANALYSIS OF CATEGORICAL DATA (3). Prerequisites, HPAA 881 and 882, or permission of the instructor. Research methodology as applied to understanding problems in health care delivery. Topics include simultaneous equation models, factor analysis, limited dependent variables and an introduction to event history analysis. Spring. Stearns.

885 [301] DOCTORAL SEMINAR IN HEALTH POLICY AND ADMINISTRATION II (3). Prerequisite, HPAA 870. Explores the nature and process of scientific inquiry in the field of health services research by examining the methodological principles and practices of social science as they are applied to health services research. Spring. Weiner.

886 [302] QUALITATIVE METHODS IN HEALTH SERVICES RESEARCH (3). Introduces students to the purposes, approaches and methods of qualitative research methods used in health services research. Fall. Weiner.

930 [330] DOCTORAL SEMINAR IN ORGANIZATION THEORY AND HEALTH SERVICE ORGANIZATIONS (3). Prerequisites, doctoral standing and HPAA 730 or equivalent, or permission of the instructor. Review and application of selected developments in organization theory to health services research. Fall. Lee.

950 [378] THE RESEARCH PROCESS (1). The course introduces doctoral students to the world of scientific and policy inquiry. It emphasizes the goal, structure and content of the dissertation that will be written in the latter part of the program. Ricketts.

951 [379] LITERATURE REVIEW AND APPRAISAL (2). This course is the second in a sequence of courses in research design and methods in the executive Dr.P.H. The purpose of this course is to explore the nature and process of scientific inquiry in the field of public health. Specifically, the course will establish a foundation for methodological exploration and focuses on the process of developing researchable questions. Spring. Brooks.

952 [380] COMMUNITY INVOLVEMENT IN RESEARCH (2). Relevant literature and guest speakers will highlight cases depicting different levels of community involvement in public health research. Spring. Calleson.

961 [607] AGING AND PUBLIC POLICY (DENT 607, DPET 607I, FMME 607, HMSC 951I, MEDI 607, NURS 783I, PSYC 907, SOWO 607I) (3).

992 [392] MASTER'S PAPER (2–3). Fall, spring and summer. Staff.

994 [394] DOCTORAL DISSERTATION (Var.). Staff.

Department of Maternal and Child Health (MHCH)

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HERBERT PETERSON, *Chair*

Professors

Janice M. Dodds (36) Leadership Development in Public Health Nutrition, Childhood Hunger, Community-Based Public Health
E. Michael Foster (07) Social Services for Children and Families and Research (Statistical) Methodology
Jonathan Kotch (17) Injury Prevention, Child Abuse and Neglect, Health and Safety in Child Care
Sandra L. Martin (40) Violence, Behavioral and Emotional Health of Children and Families, Substance Use, Prison Health
Herbert Peterson (01) International Health, Reproductive Health
John Thorp Jr., Preterm Birth, Birth Asphyxia, Episiotomy, Community Child Health

Associate Professors

Trude A. Bennett (48) Women's Health and Maternal Morbidity; Intersection of Race, Class and Gender in Maternal and Child Health (MCH); Reproductive Health and Social Welfare Policy
Carolyn Halpern (32) Adolescent Health and Development, Sexual Health and Research, Methodology
Lewis Margolis (43) Child Health Policy, Injury Epidemiology, Community-Based Public Health
Anna Maria Siega-Riz (41) Maternal and Child Nutrition, Reproductive Epidemiology, Dietary Trends among Minorities in the United States

Clinical Professors

Alan Cross (42) Pediatrics, Adolescent Health, School Health and Infant Mortality Prevention
Anita M. Farel (33) Program and Policy Development for Children with Special Health Care Needs, Public Health Practice, Professor of the Practice
Miriam Labbok (13), Infant Feeding, Health Outcomes

Research Professor

J. Richard Udry (14) Population, Demography, Sexual Behavior, Gender Roles, Program Evaluation

Research Associate Professors

Sian Curtis (49) Contraceptive Use Dynamics, International Reproductive and Maternal Health, Monitoring and Evaluation Methods for Population and Health Programs, Multilevel Models, Statistical Demography
Cathy L. Melvin (18) Reproductive Health, Smoking during Pregnancy, Program and Policy Development
Ruth Petersen (09) Violence in Pregnancy, Unintended Pregnancies, Adolescent Health
Ilene Speizer (15) Unintended Pregnancy Prevention, Evaluation of Reproductive Health Programs in Developing Countries, Adolescent Health, Male/Couple Involvement, Gender-Based Violence

Assistant Professors

Gustavo Angeles (75) Research Methods, Program Evaluation Health Economics, International Health
Julie Daniels (71) Epidemiology of Reproductive Health, Infant and Child Growth and Development, Autism and Developmental Disabilities, Environmental Exposures Related to Reproductive and Developmental Outcomes
Andrea Weathers (77) Health Care Utilization/Access, Children in Poverty, Ethnic/Cultural Minorities, Immigrant Children
Clinical Associate Professor
Vijaya Hogan (76) Perinatal Epidemiology, Preterm Delivery, Infant Mortality, Health Disparities

Research Assistant Professors

Shelah Bloom (73) HIV/AIDS, Reproductive Health, Maternal Mortality and Morbidity, Gender Context of Reproductive Health
Claudia Fernandez (31) Leadership Development, Leadership Issues in Healthcare and Related Fields
Jon M. Hussey (34) Child Abuse and Neglect, Child and Adolescent Health, Injury Prevention, Population
Tamar Ringel-Kulka (41) Functional Foods, Probiotics, Obesity, Breastfeeding, Children and Adolescents Health Promotion and Disease Prevention.
Kavita Singh (10) Child Survival, Displaced Populations and HIV/AIDS Orphans

Adjunct Professors

Bruce Barron
Jose Belizan, International Maternal and Child Health, Maternal Mortality and Morbidity
Pouru Bhiwandiwalla, Obstetrics and Gynecology, International Women's Health, Maternal and Child Health

Gerard L. Breart, Perinatal Epidemiology, Epidemiology of Osteoporosis, Evaluation of Preventive Interventions, Clinical Epidemiology
Paul A. Buescher, MCH Infant Health, Poverty and Health, MCH Program Evaluation
Judith Fortney, Maternal Morbidity and Mortality in Developing Countries
Marcia Herman-Giddens, Child Abuse, Child Fatalities, Alternative Healing
Denise Hallfors, Adolescent Health, Community Prevention Programs, Substance Abuse Prevention, Child and Adolescent Mental Health
Roy Jacobstein
Marian Johnson-Thompson
Michael Kafrissen, Clinical Reproductive Health
Lynn Knauff, International Family Planning (FP) and Maternal Health, Training of FP/MCH Health Personnel, MCH/FP Program Development and Evaluation
Robert Meyer, Reproductive and Perinatal Epidemiology, Birth Defects Surveillance, Program Evaluations
Roland E. Mhlanga, Obstetrics and Gynecology
Merry-K Moos, Prenatal Care, Women's Preventive Health, Fertility Decision Making
Kevin J. Ryan, Statewide Delivery of Women's Health Services, Prenatal Health, Health Care Ethics
Katherine Shea
Amy O. Tsui, International Family Planning, Reproductive Health, Research Methods
Thomas Vitaglione, Early Childhood Programming, Health Care Financing

Adjunct Associate Professors

Patsy Bailey, International Maternal and Child Health
Priscilla Guild, MCH and Primary Care Health Services Planning and Evaluation
Deborah Billings, International Family Health
Joseph DeGraft-Johnson, International Reproductive Health
Abigail English, Adolescent Health Law
Alfredo Fort, International Reproductive Health in Latin America, Program Research and Evaluation
Kathryn E. (Beth) Moracco, Women's Health, Violence against Women, Program Planning and Evaluation
Robert Murphy
Susan Spalt, School Health, Adolescent Substance Abuse, HIV
John Stanback, International Family Health
Jane Stein, Women's Health in Developing Countries, Social Determinants of Health, Evaluation
Mary Rose Tully, Lactation

Adjunct Assistant Professors

Joy Baumgartner
Mary Benson
Colleen Bridger
Cecilia Casanueva
Dorothy Cilenti
Caroline Whitehead Doherty, Primary Health Care for Farm Workers, Health, Hispanic Health, Reproductive Health
Cyril Engmann
Norma Gavin
Elaine Hart-Brothers, Women's Health, Cardiovascular Epidemiology, Education and Prevention
Heidi Bart Johnston, Reproductive Health
Eileen Kugler, Community Health Programs
Wendy Lam
Li-Ching Lee
Jack Leiss, MCH Research
Kara McGee
Denise Nadeau, Family Planning, Reproductive Health
Savithri Nageswaren
Heidi Reynolds
Susan Rogers, Demography, Sexually Transmitted Disease (STD)
Catherine Rohweder
Jo Shackelford, Children with Special Needs, Special Education Legislation
Lucille Siegel, Pregnant Women and Infants
Stephanie Triantafillou
Sarah Verbiest

Lecturers

Kathryn Clark, Biostatistics
Jacqueline Resnick, Research Training, Proposal Development

Professors Emeriti

Jaroslav Fabian Hulka
Howard Jacobson
C. Arden Miller
Earl Schaefer
Elizabeth Watkins

Associate Professors Emeritae

Dorothy C. Browne
Geraldine Gourley

Courses

605 (001) SURVEY COURSE ON OPTIMAL INFANT AND YOUNG CHILD FEEDING (3). This survey course will briefly cover the principal topics in this broad field of knowledge, including domestic and global issues. Teaching methods will be primarily lecture with discussion and student presentations. The topics will include relevant maternal and infant anatomy, physiology and endocrinology; complementary feeding; immunology and disease; pathology, pharmacology and exposures; psychology, sociology and anthropology; growth and development; research issues; ethics, Code of Marketing and other legal issues; breastfeeding support skills; counseling, communication and advocacy; and programming and policy. Grading will be based on participation, presentations and a mid-term test and final exam. Spring. Labbok, Tully.

610 [200] ISSUES IN MATERNAL AND CHILD HEALTH (3). Prerequisite, permission of the instructor. For students outside the department of MCH who desire a survey of current issues and programs in maternal and child health. Three lecture hours per week. Spring. Benett.

611 [111] NUTRITION OF CHILDREN AND MOTHERS (NUTR 611) (3). Prerequisite, NUTR 400 or equivalent. Biological bases for nutrient requirements and dietary recommendations as they vary throughout the life cycle. Covers the nutritional needs of women during childbearing years, infants, children and adolescents. Fall. Adair.

664 (140) GLOBALIZATION AND HEALTH (HPAA 664) (3). The course examines multiple dimensions of globalization and explores their direct and indirect effects on determinants of health through presentations, case studies, class discussions, small group seminars, readings, weekly short written assignments, a critical book review and a final paper and poster session. An expected outcome of the course is that students will gain a deeper understanding of how the changes and transformations of globalization and development affect health, and will have examined responses and approaches to current global patterns that contribute to positive and adverse health effects and health inequalities. This course is an alternative core course to Interdisciplinary Perspectives in Global Health, taught in the fall semester, for students enrolled in the Global Health Certificate Program. Spring. B. Fried and L. Knauff.

701 FOUNDATIONS OF MATERNAL AND CHILD HEALTH (4). This course introduces the major issues affecting the health and well-being of women during the reproductive years, infants, children and adolescents in domestic and international settings. First semester of a two-semester course. Permission required for nonmajors. Fall. Margolis, Kotch.

702 FOUNDATIONS OF MATERNAL AND CHILD HEALTH (4). Second part of a two-part course that introduces the major issues affecting the health and

well-being of women during the reproductive years, infants, children and adolescents in domestic and international settings. Second semester of a two semester course. Permission required for nonmajors. Spring. Margolis, Kotch.

704 (740) CRITICAL REVIEW OF AN INFANT FEEDING ISSUE (3). This independent study will include selection of a research area that would allow preparation of a coauthored paper for peer-review publication on an approved subject related to infant and young child feeding and care and associated maternal health and nutrition issues. Students will meet biweekly for two hours to discuss progress and related "current events" to help shape approaches to evidence-based advocacy. Additional individual sessions will be held biweekly. Fall. Labbok.

705 [205] INTERNATIONAL FAMILY PLANNING (3). Permission required. Prerequisite, graduate study in MHCH. Analysis of the family planning movement, its policies, operations and research, with emphasis on developing countries. Three lecture hours a week. Fall. Curtis.

712 [315] PROGRAM ASSESSMENT IN MATERNAL AND CHILD HEALTH (3). Nonmajors must have permission of the instructor. Offers an opportunity for students to explore in greater depth a selected MCH practice topic. Students will learn how to provide consultation about a selected program activity. Spring. Farel.

713 [213] RESEARCH METHODS IN MATERNAL AND CHILD HEALTH (3). Permission required for non-MCH majors. The art and science of MCH research, with an emphasis on applied survey research. Student groups will design and carry out a small survey, and present their findings in a poster presentation. Focuses on assessment of MCH population characteristics, secondary data analysis and the evaluation of MCH programs. A practicum-based course. Three lecture hours per week. Fall. Hussey.

713L [213L] RESEARCH AND EVALUATION METHODS IN MATERNAL AND CHILD HEALTH LAB (1). Corequisite, MHCH 713. Permission required for nonmajors. The MHCH 713 Lab, which is a companion course to MHCH 713, introduces students to statistical analysis using SPSS-PC and microcomputers. Two lab hours per week. Fall. Hussey.

714 [246] MATERNAL AND CHILD HEALTH PROGRAM PLANNING AND EVALUATION (3). Permission required for nonmajors in SPH. Students will develop research skills related to needs assessment, conceptualization of MCH problems, selection of effective program setting measurable objectives, implementation and evaluation. Final product will be a proposal for funding an MCH program. Fall. Dodds.

715 [215] MATERNAL AND CHILD HEALTH MANAGEMENT (3). Permission of the instructor required for nonmajors. Students become familiar with organizational processes, management principles and tools required for effective management of health programs and facilities. A variety of learning techniques will be used. Three lecture hours a week. Fall. Melvin.

716 [216] INTERNATIONAL FAMILY PLANNING AND REPRODUCTIVE HEALTH (3). Permission required for nonmajors. Course provides overview of critical issues including major theoretical frameworks, patterns and trends over time, and overview of history of family planning and reproductive health policy development. Three lecture hours per week. Spring. Bloom.

717 [214] FIELD TRAINING IN MATERNAL AND CHILD HEALTH (2–8). A faculty-supervised field experience in maternal and child health research, community practice, program planning and evaluation. Students are supervised on-site by department-approved field instructor. An additional field fee of $350 is assessed. Fall, spring and summer. Minimum of six weeks. Staff.

718 [208] CONCURRENT FIELD TRAINING IN MATERNAL AND CHILD HEALTH (1–4). Prerequisite, MHCH major. An elective, faculty-supervised field experience in maternal and child health research, community practice, program planning and evaluation. Students are supervised on-site by department-approved field instructor. Students choosing this elective are not exempt from MHCH 717. Variable number of hours. Fall, spring and summer. Staff.

721 [221] MATERNAL AND CHILD HEALTH ISSUES FOR IMMIGRANT POPULATIONS (3). Prerequisites, BIOS 600, EPID 600, MHCH 701/702. Course covers the new pattern of immigration in the United States, not only in social, economical and political landscapes, but in the health services arena as well. Spring. Weathers.

722 [222] ISSUES IN INTERNATIONAL MATERNAL AND CHILD HEALTH (3). Permission required for nonmajors. The course focuses on key issues concerning the health status and needs of mothers and children, primarily but not exclusively in the developing world. Topics include primary health care; measurement and indicators of health status; levels and patterns of maternal and child morbidity and mortality; major programmatic intervention; oral rehydration therapy; and national policy orientations towards the health needs of these two groups. Three lecture hours per week. Fall. Singh.

725 [125] INJURY AS A PUBLIC HEALTH PROBLEM (HBHE 725) (3). Prerequisite or corequisite, EPID 600. This course considers the causes and consequences of traumatic injury within developmental, social and economic contexts, including dilemmas in injury prevention. Injuries associated with transportation, violence and the home and occupational environments are included. Three lectures per week. Fall. Runyan, Kotch.

730 [230] REPRODUCTIVE HEALTH POLICY (3). Permission of the instructor required. Participants examine forces that shape social policy relating to reproduction and differential impact of policy based on age and other factors. Focus on global controversies in reproduction/reproductive health services in context of human/women's rights. Three lecture hours a week. Spring. Bennett.

740 [140] PROBLEMS IN MATERNAL AND CHILD HEALTH (1–3). Prerequisites to be arranged with departmental faculty in each individual case. Two to six hours a week. Fall, spring and summer. Staff.

753 [253] VIOLENCE AGAINST WOMEN (3). Permission required for non-MCH majors. Violence against women is examined as a public health problem. Areas investigated include definitional issues, prevalence of the problem, risk factors and outcomes, and community and medical interventions. Spring. Martin.

756 [256] UNDERSTANDING AND ADDRESSING HEALTH INEQUALITIES IN THE U.S. (PUBH 756) (3). Disparities in morbidity/mortality in subpopulations continue compared to other U.S. populations. Explore contributors to inequalities and identify strategies to counterbalance contributors to correct inequalities using public health resources. Three lecture hours per week. Spring. Hogan.

757 SPECIAL CHILD POPULATIONS (3). This course will focus on two populations that warrant special attention. By examining these populations in one course, students will be exposed to a range of contemporary issues that cut across childhood development. Both sections will emphasize the role of empirical research in understanding growth and development and formulating health services policies and programs. The first part of the course will focus on access to services for children with chronic conditions. Children with chronic conditions require not only primary and specialty care in the health services system, but also diverse nonmedical services. The second part of the course will focus on the developmental transitions of adolescence, and their implications for risk taking and health. Course participants will analyze current programs, interventions and public policies as they relate to these two special populations. Throughout the semester, students will examine their own attitudes toward and experience with children and youth with special needs. Fall. Farel, Halpern.

759 (001) CAUSAL INFERENCE IN PUBLIC HEALTH (3). This course will explore the latest statistical tools for exploring these issues and drawing on literature from economics, program evaluation and statistics. Building on a conceptual framework based in the Rubin/Roy model of causality, we will examine propensity scores, instrumental variables, G estimation, among others. The course will explore recent methods to examine the sensitivity of findings to unobserved confounding. Students will learn how to implement the relevant models in Stata or R. Prerequisite, an introductory graduate-level course in econometrics or biostatistics. Spring. Foster.

801 [301] DOCTORAL SEMINAR IN MATERNAL AND CHILD HEALTH (3). Permission required for nonmajors and master's students. Prerequisite, MHCH 701/L, 702/L or equivalents, or MPH in MHCH. This seminar explores the origins of and developments in major maternal and child health policies and programs in order to understand their effects on the health of mothers and children. Three lecture hours per week. Spring. Margolis.

802 [302] DOCTORAL SEMINAR IN MATERNAL AND CHILD HEALTH (1). Permission required for nonmajors and master's students. Prerequisite, enrollment in the MCH doctoral program. This seminar is the first semester of a one-year research skills colloquium for all new doctoral students. The course addresses research, problem definition, proposal design and development. One-hour seminar a week. Fall. Staff.

803 [303] DOCTORAL RESEARCH SKILLS COLLOQUIUM (1). Permission required for nonmajors and master's students. Prerequisite, enrollment in the MCH doctoral program. This seminar is the second semester of a one-year research skills colloquium for all new doctoral students. The course addresses research, problem definition, proposal design and development. One-hour seminar a week. Spring. Staff.

840 [340] MATERNAL AND CHILD HEALTH DOCTORAL INTERNSHIP (1). Prerequisite, enrollment in MCH doctoral program. MCH internship to enhance doctoral training in areas of Section 1: Teaching; Section 2: Practice; and Section 3: Research. Fall, spring and summer. Staff.

851 [219] PERINATAL EPIDEMIOLOGY (EPID 851) (3). Prerequisite, EPID 600, BIOS 600 or equivalents. Epidemiology of major reproductive health outcomes, including infertility, fetal loss, birthweight, congenital malformations, infant mortality. Current knowledge regarding epidemiology of these outcomes; discussion of methodologic issues specific to reproduction. Fall. Olshan, McMahon.

853 [350] ADVANCED TOPICS IN PERINATAL AND PEDIATRIC EPIDEMIOLOGY (EPID 853) (2). Permission of the instructor required for master's students. Critical review of current topics in and methods for perinatal and pediatric epidemiology. Prerequisites, EPID 710 and EPID/MHCH 851. Two lecture hours per week. Spring. Daniels.

859 [259] THEORETICAL PERSPECTIVES ON MATERNAL AND CHILD HEALTH (3). Prerequisites, doctoral students, permission of the instructor. A survey of theoretical models used in MCH research and program development, and how those models are used to guide the formulation of questions, hypothesis testing and evaluation. Fall. Halpern.

860 [260] CONCEPTUALIZATION, DESIGN, AND MEASUREMENT (3). Permission required of nonmajors and master's students. Prerequisite, MHCH 859. The course follows the research process from the formulation of a research question and the design of a research methodology to the addressing of the question through the design of an appropriate analysis strategy. Three lecture hours a week. Spring. Martin.

862 [262] MATERNAL AND CHILD HEALTH PROGRAM EVALUATION (3). Permission required for nonmajors and master's students. Prerequisite, knowledge of SAS or Stata, MHCH 713 or equivalent. Analytic skills seminar focusing on the theory and practice of MCH program evaluation. Through examples of MCH program evaluations and a student class project, students are exposed to all phases and issues surrounding MCH program evaluation (including conceptualization, negotiations, management operations, analytic strategies implementation, presentation, etc.). Three lecture hours a week. Spring. Angeles.

892 [306] SEMINAR IN HEALTH DISPARITIES (EPID 892) (1). This seminar will provide an opportunity for students to explore in greater depth selected topics/issues relating to the study of and intervention on health inequities. Select topics on theory, measurement or intervention will be discussed. Fall. Hogan, Hines.

992 [392] MASTER'S PAPER (Var.). Fall, spring and summer.

993 [393] MASTER'S THESIS (Var.). Fall and spring.

994 [394] DOCTORAL DISSERTATION (Var.). Fall, spring and summer.

Department of Nutrition (NUTR)

www.sph.unc.edu/nutr

JUNE STEVENS, *Chair*

Professors

Linda S. Adair (34) Maternal and Child Nutrition, International Nutrition, Child Growth, Long-Term Effects of Early Childhood Nutritional Exposures

Alice S. Ammerman (41) Design and Evaluation of Nutrition and Physical Activity Interventions for Chronic Disease Risk Reduction (Obesity, Cancer, Heart Disease, Diabetes) in Lower Income and Minority Youth and Adults, Patterns of Diet-Related Practice in Primary Care

Melinda Beck (70) Antioxidant Nutrition and Infectious Disease, Obesity and Infectious Disease, Nutritional Status and Immune Function

Margaret Bentley (67) Nutritional Anthropology, Sociocultural Determinants of Infant and Child Feeding, Breastfeeding and Reproductive Health

Cynthia M. Bulik (98) Twin and Molecular Genetic Studies of Eating Disorders and Weight Regulation, Application of Information Technology to Upgrading Cognitive-Behavioral Treatment for Eating Disorders and Overweight, Eating Disorders and Reproduction, Parenting Assistance for Women with Eating Disorders

Marci K. Campbell (57) Nutritional and Health Behavior Change Interventions, Cancer Prevention and Control, Health Communication, Minority Health

Stephen G. Chaney (43) Mechanism of Action of Platinum Anticancer Agents, DNA Repair, HPLC Methodology

Rosalind A. Coleman (39) Diabetes: Lipid and Carbohydrate Metabolism, Obesity, Partitioning of Energy between Triacylglycerol Storage and Fatty Acid Oxidation, Regulation of Triacylglycerol Synthesis, Fatty Acid Metabolism and Cardiac Function

Janice M. Dodds (36) Nutrition Policy, Leadership Development in Public Health Nutrition, Community-Based Program Implementation

Anthony C. Hackney (50) Endocrine and Metabolic Responses to Physical Stress, Physiology of Exercise

Mark Koruda, Surgery, Parenteral and External Nutrition

Pauline K. Lund (69) Insulin-Like Growth Factors, Intestinal Development, Nutrient and Cytokine Interactions in Intestinal Inflammation, Injury and Repair, Intestinal Stem Cells

Nobuyo Maeda (77) Animal Models of Hyperlipidemia, Atherosclerosis and Cardiomyopathy

Elizabeth J. Mayer-Davis (33) Nutrition and the Etiology and Treatment of Type 1 and Type 2 Diabetes in Children and Adults, Epidemiology of Diabetes, Diabetes Self-Management for Individuals Living in Medically Underserved Communities

Robert G. McMurray (51) Exercise Physiology, Energy Expenditure of Activity, Cardiovascular Disease Risk Factors and Obesity in Youth, Multiple Metabolic Syndrome, Sports Nutrition

Daniel Pomp (90) Obesity: Genetic Predisposition for Components of Energy Balance, Gene x Diet Interactions, Fat as a Risk Factor for Cancer

Barry M. Popkin (17) The Nutrition Transition: Patterns and Determinants of Dietary Trends and Body Composition Trends (United States and Low Income Countries), Obesity Dynamics and Their Environment Causes, Dietary and Physical Activity Patterns, Trends and Determinants, Creation of Large-Scale Program and Policy Initiatives to Address Nutrition-Related Noncommunicable Diseases

June Stevens (56) Epidemiologic Studies of the Causes and Consequences of Obesity, Intervention Trials to Improve Diet, Increase Physical Activity and Prevent Obesity, Obesity Trends, Risk Factors and Consequences among Ethnic Groups, Long-Term and Short-Term Effects of Obesity and Weight Change on Health, Obesity Policy

James Swenberg, Chemical Carcinogenesis and Toxicology, DNA Damage and Repair, Oxidative Stress, Biomarkers and Mass Spectrometry

Dianne Ward, (79) Community- and School-Based Interventions to Prevent Obesity and Promote Healthy Weight Behaviors, Measurement of Physical Activity

Steven H. Zeisel (38) Nutrients and Brain Development, Choline Metabolism and Requirements in the Human, Nutrigenomics, Computer-Assisted Instruction

Associate Professors

Penny Gordon-Larsen (78) Obesity Epidemiology, Physical Activity, Environmental and Sociodemographic Determinants of Obesity, Minority Health, Adolescent Nutrition and Health, Gene by Environment Interactions and Weight Gain

Pamela S. Haines (32) Aging, Dietary Trends, Patterns and Determinants, Diet Quality Assessment, Women's Health, Nutrition and Public Policy, Nutrition Epidemiology

Jessie A. Satia (81) Nutritional Epidemiology, Cancer Survivorship, Dietary Assessment, Health Disparities, Health Communications

Anna Maria Siega-Riz (62) Maternal Nutrition and Birth Outcomes, Infant and Child Dietary Habits, Obesity Development in Women of Reproductive Age, Infants and Children, Gestational Diabetes, Diet Methodology and Reproductive Epidemiology

Boyd R. Switzer (5) Cancer and Carotenoids, Phytochemicals, Vitamin A and E and Nutritional Biomarkers

Assistant Professors

Terry Combs (88) Glucose and Lipid Metabolism, Obesity, Cancer and Aging

Ka He (96) Nutritional Epidemiology, Cardiovascular Diseases, Cerebrovascular Disease, Obesity, Diabetes and Metabolic Syndrome

Deborah F. Tate (95) Obesity Prevention and Treatment in Adults and Adolescents, Application of New Technology and the Internet to Behavioral Treatments for Overweight, Obesity Treatment in Worksites and Community Settings

Research Professors

Martin Kohlmeier (53) Nutritional Genetics, Biomarkers in Nutritional Epidemiology, Lipoprotein Metabolism, Vitamin K Transport and Function, Nutrition Education in Medical Schools

Research Associate Professor

Miroslav Styblo (72) Biochemistry and Molecular Toxicology of Essential and Toxic Trace Metals and Metalloids

Research Assistant Professors

Rebecca Cleveland, Obesity, Weight Change and Physical Activity in Cancer Epidemiology, Genetic and Molecular Markers of Metabolic Syndrome in Cancer, Diabetes

Marlyn Allicock, Cancer Prevention and Control, Dissemination Research and Evaluation, Health Disparities

Kerry-Ann da Costa (58) Choline, Folate and Metabolism

Zuzana Drobna, Nutrition and Cancer, Isoflavonoids and Food Components, Leukemia, Metabolism of Metalloids

Leslie Fischer (87) Human Choline Requirements and Sequelae of Choline Deficiency, Choline and Brain Development

Kristine Kelsey (71) Health Promotion and Disease Prevention, Prevention of Childhood Obesity, Health Behavior Change, Women's Health

Mihai Niculescu

Eric Park, Diet and Carcinogenesis, Dietary Components and Inflammation

Carmen Samuel-Hodge (86) Interventions in Diabetes Self-Management Education, Weight Loss and Lifestyle Behavior Change Interventions, Peer Counselors/Lay Advisors in Community-Based Nutrition Interventions

Kimberly Truesdale

Clinical Professor

William D. Heizer (46) Gastrointestinal Absorption, Malabsorption Syndromes, Consequences of Long-Term Parenteral Nutrition in Hospitalized Patients, Digestive Diseases Causing Malnutrition

Clinical Assistant Professor

Amanda S. Holliday (99) Professional Development, Clinical Nutrition, Clinical Nutrition Management

Adjunct Professors

John J. B. Anderson, Calcium, Isoflavones, Other Nutrients and Bone Indices in Women, Osteoporosis, Physical Activity and Body Composition, Diet and Aging

Bernard Gutin

Bernadette Marriott

Ellen Piwoz

Richard C. Theuer, Infant Foods and Nutrition

Adjunct Associate Professors

Alvin Berger

Katherine M. Flegal, Epidemiology of Obesity and Related Conditions, Dietary Assessment Methods, Misclassification and Measurement Error

Temitope Keku

Adjunct Assistant Professors

Marjorie Busby, Human Clinical Nutrition

Melissa Daniels, International Maternal and Child Nutrition, Dietary Assessment Methods, Screening of Malnutrition Risk

Juhaeri Juhaeri, Obesity Epidemiology, Cardiovascular Epidemiology, Pharmcoepidemiology and Epidemiology Methods

Miriam Peterson

Adjunct Research Professor

Rudolf Salganik, Oxidative Stress, Apoptosis and Cancer

Adjunct Research Assistant Professor

Barbara Laraia, Influence of Food Security on Health Outcomes within Vulnerable Populations, Maternal Nutrition and Birth Outcomes, Nutrition Policy

Adjunct Instructor

Angelo Mojica (94) Food Service Management

Professors Emeriti

Rebecca B. Bryan

Joseph C. Edozien

MaryAnn C. Farthing

Mildred Kaufman

Courses

NUTR 400 [100] INTRODUCTION TO MEDICAL NUTRITION (3). Prerequisites, BIOL 101, CHEM 101 and 102, NUTR 240. Function of the human body focusing on nutrient interaction. Review of structure and function of cells and organs. For advanced undergraduates and graduate students needing to enhance background prior to NUTR 600. Spring. Switzer.

NUTR 600 [110] HUMAN METABOLISM: MACRONUTRIENTS (3). Prerequisite, NUTR 400 or equivalent. Cell biochemistry and physiology emphasizing integration of proteins, carbohydrates and lipids in whole-body metabolism, regulation of energy expenditure, food intake, metabolic adaptations and gene expression, and macronutrient-related diseases (atherosclerosis, obesity). Fall. Coleman and Faculty.

NUTR 611 [111] NUTRITION OF CHILDREN AND MOTHERS (MHCH 611) (3). Prerequisites, NUTR 400 or equivalent, to be taken in parallel with NUTR 600. Biologic bases for nutrient requirements and dietary recommendations as they vary throughout the life cycle. Covers the nutritional needs of women during childbearing years, infants, children and adolescents. Fall. Gordon-Larsen and Siega-Riz.

NUTR 615 [112] NUTRITION IN THE ELDERLY (1). Prerequisites, NUTR 400 or equivalent. Special dietary and nutritional needs and conditions of the elderly. Includes overview of biology and demography of aging, discussion of nutritional requirements and assessment of the elderly, as well as nutrition in health and various disease states of the elderly. Spring. Holliday.

NUTR 620 [120] HUMAN METABOLISM: MICRONUTRIENTS (3). Prerequisite, NUTR 400, NUTR 600 or equivalent. Cell biochemistry and physiology emphasizing metabolism of vitamins and minerals including antioxidant protection, immune function, nutrient control of gene expression and disease states induced by deficiencies (e.g., iron-deficient anemia). Spring. Beck.

NUTR 630 [132] NUTRITION ASSESSMENT AND COUNSELING SKILLS (3). Prerequisite, NUTR 240 or equivalent. Functions of a dietitian working with individuals, emphasizing interviewing, assessment, nutrition care planning, counseling and service documentation in prevention and therapeutic situations. Practice in the use of current dietary analysis software programs and development of educational materials included. Fall. Holliday.

NUTR 640 [121] MEDICAL NUTRITION THERAPY (3). Prerequisite, NUTR 630; corequisite, NUTR 620. Course designed to examine the rationale and implementation of diet therapy and nutrition support in the prevention or treatment of disease. Spring. Holliday.

NUTR 650 [140] FOOD SCIENCE, PRODUCTION AND MEAL PREPARATION (2). Prerequisite, NUTR 400. Introduction to foods, food composition and properties, factors affecting selection, handling and prep of foods, food safety, basic food industry knowledge, meal planning. NUTR 650 lab required. Fall. Holliday.

NUTR 650L FOOD SCIENCE, PRODUCTION AND MEAL PREPARATION LAB (1). Concurrent with NUTR 650. This is the lab that accompanies NUTR 650. This lab applies the basic concepts of meal preparation, food production and food science. Lab fee of $50. Three lab hours per week. Fall. Holliday.

NUTR 660 [141] FOOD SERVICE SYSTEMS MANAGEMENT (2). Permission of the instructor required for nonmajors. Basic concepts of institutional food service systems management applied to small and medium-sized health care facilities in the community. Fall/spring. Mojica.

NUTR 660L [141L] FOOD SERVICE SYSTEMS MANAGEMENT (1). Prerequisite or corequisite, NUTR 660. This is a food service management practicum that applies the basic concepts of institutional food service systems. Two laboratory hours per week. Fall/spring. Mojica.

NUTR 680 [150] NUTRITION POLICY AND PROGRAMS (2). Prerequisite, NUTR 240. Introduction to program and policy approaches for improving nutritional status of populations. Broad basis and rationale for nutrition policy introduced. Design, implementation of relevant food, nutrition and health programs examined. Fall. Havala Hobbs.

NUTR 695 [190] NUTRITION RESEARCH (1–9). Permission of the instructor. Individual arrangements with faculty for bachelor and master students to participate in ongoing research. Fall, spring and summer. Faculty.

NUTR 696 [170] READINGS IN NUTRITION (1–9). Permission of the instructor. Reading and tutorial guidance in special areas of nutrition. Fall, spring and summer. Faculty.

NUTR 700 [200] NUTRITION IN MEDICINE (2). Prerequisite, BIOL 252 and NUTR 600 or equivalent. Comprehensive review of nutrition basics with strong clinical perspective. Integrates nutrient biochemistry and metabolism into a framework of nutritional assessment and dietary intervention. Fall. Mayer-Davis.

NUTR 710 [220] CLINICAL NUTRITION EXPERIENCE (6). Prerequisites, NUTR 620, 640, 630. Students are assigned to medical facilities where, under the supervision of registered dietitians, they participate in the nutritional care of patients. Field fee of $450. Forty hours per week for 12 weeks. Summer. Holliday and field preceptors.

NUTR 715 [230] DIETARY CHANGE INTERVENTIONS (3). Prerequisites, NUTR 680 or permission of the instructor. Focus on developing theory-based nutrition interventions at the population level. Addresses levels of interventions such as individual, social network, organizational (e.g., schools and work sites), methods of implementation (including social marketing and mass media) and principles of assessing change. Spring. Campbell.

NUTR 720 [250] PUBLIC HEALTH NUTRITION MANAGEMENT I (4). Prerequisite, NUTR 680. Addresses roles and functions of the health care team and nutritionist in providing nutrition services at the community level. Includes community assessment and organization, quality assurance and program evaluation, and basic personnel management. Three lecture hours and one-day concurrent field experience per week. Fall. Samuel-Hodge.

NUTR 725 [251] PUBLIC HEALTH NUTRITION MANAGEMENT II (4). Prerequisite, NUTR 720. An overview of the planning and management of local, state, federal and voluntary public health nutrition programs. Examines legislative and administrative structures. Includes grant writing for program development. Three lecture hours and one-day concurrent field experience per week. Spring. Dodds.

NUTR 730 [252] PUBLIC HEALTH FIELD EXPERIENCE (4). Prerequisites, NUTR 710 and NUTR 725. During a consecutive eight-week block of time, students are assigned to a state, local or district health agency or other appropriate agency for their supervised field experience. Field fee of $450. Fall, spring and summer. Switzer.

NUTR 735 [253] NATIONAL NUTRITION ISSUES (1). Prerequisite, NUTR 725 or permission of the instructor. Three-day in-depth seminar held in Washington, DC on national nutrition issues, policy formulation and program development with key congressional staff, federal agencies' staff and pertinent public interest/consumer advocacy groups. Paper required. Field fee of $50. Spring. Kelsey and Stevens.

NUTR 740 [255] BLOCK FIELD RESEARCH (4). Prerequisite, NUTR 700 and NUTR 813. During a consecutive 10-week block of time, students conduct nutrition-related research on topics including cancer, diabetes, hypertension, obesity and cardiovascular disease. Supervised by an approved faculty and mentor. Field fee of $450. Fall, spring and summer. Faculty.

NUTR 745 [261] INTERNATIONAL NUTRITION (3). Provides a broad overview of international nutrition research issues, programs and policies. Topics will include micronutrient deficiencies, child feeding and growth, determinants of under- and over-nutrition, chronic disease and nutrition, food fortification and supplementation and nutrition intervention programs and policy. Fall. Adair and Bentley.

NUTR 750 [262] INTERNATIONAL NUTRITION: SPECIAL TOPICS (1). Prerequisite, NUTR 745. Follow-up in greater detail of selected issues discussed in NUTR 745. Two seminar hours per week. Spring. Adair.

NUTR 753 [354] QUALITATIVE EVALUATION AND RESEARCH METHODS (HBHE 753) (3). Prerequisite, HBHE 750 or equivalent. Theoretical and methodological approaches of applied medical anthropology for health program development and evaluation. Field methods for collecting and analyzing data through observation, interviewing, group methods and case studies. Spring. Maman.

NUTR 780 PUBLIC HEALTH ENTREPRENEURSHIP (3) Prerequisite, approval of instructor (complete application—www.unc.edu/cei/grad). Basic concept underlying commercial and social entrepreneurship applied to public health, including guest lectures by individuals with proven success in these areas. Spring. Ammerman and Pomp.

NUTR 810 [254] PHYSICAL ACTIVITY EPIDEMIOLOGY AND PUBLIC HEALTH (EPID 810) (3). Prerequisite, EPID 600 or equivalent. This course provides an overview of major issues in physical activity measurement, population distribution, correlates, impacts (physically and economically) and public health recommendations. Interventions, including relevant theories, will be reviewed. Fall. Ward.

NUTR 811 DEVELOPMENT OF HEALTH PROMOTION AND DISEASE PREVENTION INTERVENTION (HBHE 811) (1–3). Prerequisite, NUTR 680 or permission of the instructor. Understanding of the role and application of both theory and empirical data n the design and development of effective behavior change interventions, with particular focus on changing nutrition behaviors. Fall. Tate.

NUTR 813 [259] NUTRITIONAL EPIDEMIOLOGY (EPID 813) (3). Prerequisites, EPID 600 or 710 and BIOS 600 or equivalent. This course reviews current topics in nutritional epidemiology and teaches the skills needed for critical evaluation of the nutritional epidemiologic literature. Spring. He.

NUTR 814 [361] OBESITY EPIDEMIOLOGY (EPID 814) (3). Prerequisites, EPID 600 or 710 and BIOS 600. Examines epidemiology research on the causes, consequences and prevention of obesity. Emphasis on methodological issues pertinent to obesity research. Spring. (Alternate years.) Stevens.

NUTR 815 [362] DIET AND CANCER (EPID 815) (3). Prerequisites, EPID 600 or 710, BIOS 600, EPID 771 and NUTR 813 (or equivalents). Examines and critically evaluates epidemiologic research on relationships of diet-related exposures with cancer etiology, prevention and survivorship. Emphasis on skills for conducting, analyzing and interpreting diet and cancer epidemiologic studies. Fall. (Alternate years.) Satia.

NUTR 818 [360] ANALYTICAL METHODS IN NUTRITIONAL EPIDEMIOLOGY (EPID 818) (3). Prerequisites, EPID 600 or 710, NUTR 813 and BIOS 545, or permission of the instructor. This course teaches the skills and techniques required to study dietary exposures, anthropometric status, and disease outcomes. Students will gain skills in analysis and interpretation of anthropometric data. Concepts and applications include quantification and measurement of dietary intake, use and management of nutrition monitoring data sets, application and interpretation of epidemiologic and statistical methods for the analysis of these data (such as linear and logistic regression and hazard modeling) and appropriate use and interpretation of anthropometric indices. Fall. (Alternate years.) Adair.

NUTR 820 [351] ADVANCED PUBLIC HEALTH NUTRITION MANAGEMENT (3). Prerequisite, M.P.H. degree or permission of the instructor. Analysis of policy development and management techniques used in the public and private sectors with relevance to the development and management of nutrition policy and programs. Spring. (Alternate years.) Dodds.

NUTR 845 [305] NUTRITIONAL METABOLISM (3). Prerequisite, NUTR 600 or equivalent. A problem-based approach to examine current topics in biochemistry relevant to nutrition and metabolism. Students interpret data and design experiments related to recent advances in nutritional biochemistry. Spring. Coleman and Nutrition Biochemistry faculty.

NUTR 850 [315] NUTRITIONAL BIOCHEMISTRY: METABOLISM AND LONGEVITY (3). Prerequisite, NUTR 600 and 620 or equivalent. Reviews the current evidence that links metabolism and longevity in humans and experimental models. Spring. (Alternating years.) Combs.

NUTR 860 [311] ADVANCED NUTRITIONAL BIOCHEMISTRY: GENETICS AND GENOMICS (2). Prerequisite, NUTR 600 or equivalent. Concepts of genetics and tools of genomics as applied to obesity and other complex traits impacted by nutrition. Spring. (Alternating years). Pomp.

NUTR 861 [312] ADVANCED NUTRITIONAL BIOCHEMISTRY: NUTRITION AND IMMUNOLOGY (2). Prerequisites, NUTR 600 and 620 or equivalent. Presents an understanding of basic immunology and the role of nutrition in modifying the immune response. Spring. (Alternate years.) Beck.

NUTR 867 [322] NUTRIENTS AND DISEASE: CARDIOVASCULAR DISEASE (2). Prerequisites, NUTR 110 and 120 or equivalent. Presents an understanding of molecular and physiological events preceding cardiovascular diseases and the role of nutrition in the prevention of modification of risk and treatment. Fall. (Alternating years.) Switzer.

NUTR 868 [323] NUTRIENTS AND DISEASE: BRAIN FUNCTION AND DEVELOPMENT (2). Prerequisites, NUTR 600 and 620 or equivalent. Seminar on nutrients that influence brain and neuron development and function. Spring. (Alternating years.) Zeisel.

NUTR 875 [335] NUTRITION POLICY SEMINAR (2). Prerequisite, permission of the instructor. Doctoral seminar to introduce federal policy strategies for monitoring and improving nutritional status of populations. Five policy areas will be covered: national nutrition objectives/planning strategies, dietary guidance, nutrition surveillance/monitoring, economic policy as related to federal feed programs and policy analysis. Fall. Ammerman.

NUTR 880 [371] ELEMENTS OF BEING A SCIENTIST (3). Prerequisites, doctoral students ready to formulate dissertation focus. Focuses on key elements that contribute to a successful career as a scientific researcher. These include scientific presentations, scientific photography and graphics, writing a scientific manuscript and evaluating published manuscripts, grant writing and sources of funding, peer review, use of animals and humans in research and scientific ethics. Fall. Popkin and Zeisel.

NUTR 885 [373] DOCTORAL SEMINAR (1). This course is designed for doctoral and master of science students only. Critical review of current literature in nutritional biochemistry, intervention and policy, and population-based nutrition science. Focuses on the development of skills in reviewing and criticizing articles. Fall (Adair and Sheridan); spring (Ward and Niculescu).

NUTR 910 [375] NUTRITION RESEARCH (1–9). Individual arrangements with faculty for doctoral students to participate in ongoing research. Fall, spring and summer. Faculty.

NUTR 920 [374] RESEARCH ROTATIONS FOR NUTRITIONAL BIOCHEMISTRY DOCTORAL STUDENTS (1–3). Three laboratory or research group rotations supervised by Nutritional Biochemistry faculty. Provides a breadth of research experience for students prior to selecting dissertation advisor. Up to six laboratory hours per week. Fall, spring and summer. da Costa.

NUTR 992 [392] MASTER'S PAPER (3–6). Fall, spring and summer. Faculty.

NUTR 993 [393] MASTER'S THESIS (3–6). Fall, spring and summer. Faculty.

NUTR 994 [394] DOCTORAL DISSERTATION (3–9). Fall, spring and summer. Faculty.

Public Health Leadership Program (PUBH)

www.sph.unc.edu/phlp

WILLIAM A. SOLLECITO, *Director*
Russell Harris, Health Care and Prevention, *Director*
Bonnie Rogers, *Occupational Health Nursing, Director (Residential and Distance)*
David Steffen, *Leadership, Director (Residential and Distance)*

Professor

Jean Goeppinger, Health Promotion and Leadership

Associate Professor

Bonnie Rogers, Occupational Health Nursing, Public Health Nursing

Research Assistant Professors

Christina A. Harlan, Migrant Health, Cultural Competency, Public Health Nursing
Sue Tolleson-Rinehart, Health Politics and Policy, Quality of Care

Clinical Professor

William A. Sollecito, Leadership, Continuous Quality Improvement, Project Management, Distance Learning

Clinical Assistant Professors

Diane Calleson, Program Planning and Evaluation, Scientific Writing, Distance Learning,
Lori A. Evarts, Project Management, Distance Learning, Continuous Quality Improvement
Gary Greenberg, Occupational Health, Epidemiology
Cheryll Lesneski, Continuous Quality Improvement, Community Assessment, Public Health Practice, Distance Learning
Judith S. Ostendorf, Occupational Health Nursing
Hollie Pavlica, Project Management, Marketing, Distance Learning

Susan A. Randolph, Occupational Health Nursing
David Steffen, Leadership, Public Health Practice, Public Health Nursing, Distance Learning
William Williamson, Public Health Practice, Scientific Writing, Distance Education

Adjunct Professors
Russ Harris, Health Care and Prevention
Hugh H. Tilson, Public Health Practice, Leadership, Epidemiology

Adjunct Associate Professor
Linda Kinsinger, Health Care and Prevention

Adjunct Assistant Professors
Kathryn Andolsek, Health Care and Prevention
Kay Campbell, Occupational Health Nursing
Gerald Gartlehner, Health Care and Prevention
Carol Golin, Health Care and Prevention
Margaret Gourlay, Health Care and Prevention
John Graham, Public Health Practice
Sheila Higgins, Public Health Nursing
Diane Kelly, Continuous Quality Improvement
Donna King, Leadership
Katherine Kirkland, Public Health Nursing
Hazel Moore, Public Health Nursing
Greg Randolph, Health Care and Prevention
Adam Searing, North Carolina Justice Center
Kevin Sowers, Public Health Nursing
Stacey Sheridan, Health Care and Prevention
Patricia Travers, Occupational Health Nursing
W. Jon Wallace, Occupational Health Nursing

Adjunct Lecturers
Vic Cocowitch, Leadership, Group Dynamics and Organizational Effectiveness
Woodhall (Sandy) Stopford, Duke University

Adjunct Instructors
Ruth Barlow, Occupational Health Nursing
Christopher Cooke, Social Marketing
Jennifer Horney, Preparedness and Public Health
Elizabeth Lawhorn, Occupational Health Nursing
Beth Lamanna, Public Health Nursing
Karen Mastroianni, Public Health Nursing

Professors Emeriti
Nora F. Cline
Marion E. Highriter
Arnold D. Kaluzny
Dorothy M. Talbot
Julia D. Watkins

The Public Health Leadership program offers masters in public health degrees in three different concentrations: leadership (LMC), health care and prevention (HC&P) and occupational health nursing (OHN)*, as well as a master of science in public health nursing. The leadership M.P.H. and the occupational health nursing M.P.H. are offered in both distance and residential formats. The Public Health Leadership program also offers graduate level, online certificate programs in leadership and occupational health nursing.*

The leadership M.P.H. is a 42 credit hour interdisciplinary and practice- based curriculum that addresses the core functions and competencies of public health. It is available in both residential and distance formats. The leadership M.P.H. was designed for individuals who already have a professional identity and area of practice but desire a broadened knowledge base in the public health sciences.

The distance leadership M.P.H. also offers four focus areas including 1) public health practice, 2) program development, 3) field epidemiology and 4) public health nursing.* Admission to the distance leadership M.P.H. program is offered in the fall only and there are two brief, required, on-campus sessions.

The health care and prevention (HC&P) M.P.H. was designed for medical students and practicing physicians who are interested in combining the clinical and population-based perspective to better serve the public. This M.P.H. program is offered in a full-time, residential format. Admission is available in summer and fall.

The occupational health nursing concentration* was designed to provide occupational health nurses with population-based practice skills emphasizing health promotion and disease prevention. This curriculum is available in both residential and distance formats, either full or part-time.

** The occupational health nursing M.P.H., the occupational health nursing certificate program and the public health nursing focus area are all accredited by the National League for Nursing (NLN), as well as the Council on Education for Public Health (CEPH) and the Southern Association of Colleges and Schools (SACS).*

Courses

The Public Health Leadership program uses both PUBH and PHNU abbreviations for course listings. PUBH courses are open to any student unless permission is required of the instructor. PHNU courses are open to registered nurses only or by permission of the instructor. Visit the Web site for additional information: www.sph.unc.edu/phlp.

PUBH 420 [120] AIDS: PRINCIPLES AND POLICY (1). Elective course jointly given by the schools of Dentistry, Public Health, Nursing, Pharmacy and Medicine, designed to provide a multifaceted understanding of social, clinical and biological aspects of the AIDS epidemic. Fall, spring and summer. Strauss.

PUBH 423 [123] AIDS SERVICE (3). This course will integrate community service into the campus-wide AIDS course. Students will work as volunteer interns three to five hours per week for 10 weeks during the semester with Triangle-area community service organizations. Fall and spring. Strauss.

PUBH 450 [150] DATA SKILLS ONLINE (1). This online, asynchronous class presents a series of discrete tools designed to teach skills to health professionals for using technology and data management/analysis. Online course. Fall, spring and summer. Williamson.

PUBH 496 [140] READINGS IN PUBLIC HEALTH PRACTICE (1–3). Intensive study of a special problem in public health practice. Fall, spring and summer. Staff.

PUBH 600 [221] HEALTH CARE IN THE UNITED STATES (3). An introduction to the fundamental organization, behavior, financing and challenges of the health system of the United States. The course treats the entire edifice of American health care as "the American health system," and intends to examine it in toto, including by comparing it to other national health systems, and in part, by examining critical components of the system. Fall and summer. Tolleson-Rinehart.

PUBH 613I [613] INTERMEDIATE SPANISH FOR HEALTH CARE 1 (AHSC 613I, DENT 613, MEDI 613, NURS 613I, PHCY 613I, SOWO 613I) (3). Prerequisites, college-level Spanish 2, a minimum score on a self-assessment test available on the Web and permission of the instructor. This primarily e-learning course provides public health students with the opportunity to improve their oral communication skills in Spanish at the intermediate level via DVD, Web and workbook. Instructor-led. Students who meet the criteria but are still not sure if the course is right for them can view a video (accessible on the Web) along

with a sample from the workbook to determine if the course materials are a good match for their abilities. Online course. Fall, spring and summer. Instructors from the UNC–Chapel Hill Department of Romance Languages.

PUBH 614I [614] INTERMEDIATE SPANISH FOR HEALTH CARE 2 (AHSC 614I, DENT 614, MEDI 614, NURS 614I, PHCY 614I, SOWO 614I) (3). Prerequisite, completion of Intermediate Spanish for Health Care 1 and permission of the instructor. This primarily e-learning course provides public health students with the opportunity to improve their oral communication skills in Spanish at the intermediate level via DVD, Web and workbook. Instructor-led. Online course. Fall, spring and summer. Instructors from the UNC–Chapel Hill Department of Romance Languages.

PUBH 615I [615] ADVANCED SPANISH FOR HEALTH CARE 1 (AHSC 615I, DENT 615I, MEDI 615I, NURS 615I, PHCY 615I, SOWO 615I) (3). Prerequisite, college-level Spanish 3, a minimum score on a self-assessment test available on the Web and permission of the instructor. This primarily e-learning course provides public health students with the opportunity to improve their oral communication skills in Spanish at the advanced level via DVD, Web and workbook. Students who meet the criteria but are still not sure if the course is right for them can view a video (accessible on the Web) along with a sample from the workbook to determine if the course materials are a good match for their abilities. Instructor-led. Online course. Fall, spring and summer. Instructors from the UNC–Chapel Hill Department of Romance Languages.

PUBH 616I [616] HEALTH CARE INFORMATICS (PHCY 616I) (2). Course designed to provide a multimodal learning experience that prepares health sciences students to learn to become proficient at selecting/using technology for organizing, analyzing and managing information in health care settings. Spring. Brock.

PUBH 670 [140] CLINICAL RESEARCH METHODS (3). This course explores contemporary issues, problems and controversies in global health through an interdisciplinary perspective. It examines the tapestry of social, economic, political and environmental factors that affect global health. Fall. Bentley.

PUBH 680 [180] PUBLIC HEALTH PRACTICE (3). A comprehensive introduction to public health concepts and practice through an examination of the philosophy, purpose, history, organization, functions, tools, activities and results of public health practice at the national, state and community levels. Online course. Fall. Lesneski.

PUBH 690 [201] SPECIAL STUDIES (1–3). Permission of the instructor required. Sections will focus on specific topics of current interest to health workers. Fliers describing the section offering will be distributed prior to registration each semester. Lecture hours per week dependent upon credit. Fall, spring and summer. Staff.

PUBH 730 [230] QUALITY IMPROVEMENT AND LEADERSHIP (3). Course designed to provide students with an understanding of use of continuous quality improvement methods in community health settings, drawing heavily on actual experiences of the students in their professional lives. Online course. Spring. Kelly.

PUBH 731 [231] SOCIAL MARKETING (3). Course will orient students to market-based strategies, models and tactics for improving individual and community health status within the framework of marketing, strategic communication and advocacy. Online course. Spring. Cooke.

PUBH 732 [232] CULTURAL COMPETENCIES OF HEALTH ORGANIZATIONS (3). Course will provide health care professionals with a framework for the implementation of National Standards for Culturally and Linguistically Appropriate Services in Health Care (CLAS). Online course. Spring. Harlan.

PUBH 733 [233] INTRODUCTION TO PUBLIC HEALTH PREPAREDNESS FOR DISASTERS AND EMERGENCIES (3). Introduction to topics related to public health preparedness for intentional and natural outbreaks and natural disasters, including food and water safety, mental health impacts and risk communication. Online course. Spring. Horney.

PUBH 735 [235] POLICY DEVELOPMENT (2). Permission of the instructor is required for non-SPH students. Focus is on institutional policy development, regulation and enforcement, and field observation. Online course. Spring. Staff.

PUBH 745 [245] COMMUNITY INTERACTION AND ASSESSMENT (3). Course focuses on development of knowledge and skills for interaction and assessment of population, advocacy, collaboration, partnerships, coalition building and constituency development. Online course. Spring. Lesneski.

PUBH 746 [246] PUBLIC HEALTH PROGRAM PLANNING AND EVALUATION (3). Permission required for non-SPH majors. Fundamentals of public health program planning and monitoring, with emphasis on applications in community settings and proposal development for program funding. Online course. Fall. Calleson.

PUBH 747 [247] PROJECT MANAGEMENT PRINCIPLES AND PRACTICES (3). Graduate students only. Provides an overview of knowledge and skills required for effective project/team leadership and management. Includes modules on leadership and management techniques and organizational designs that complement team-based organizations. Also includes an introduction to continuous quality improvement, with an emphasis on application to project management. Online course. Spring and summer. Pavlica and Sollecito.

PUBH 748 [248] POLICY DEVELOPMENT (2). Permission of the instructor is required for non-SPH students. Designed to provide students with an opportunity to focus on the fundamental aspects of policy development, with an emphasis on local, state and federal levels within a community setting. Online course. Fall. Randolph.

PUBH 750 [250] STRATEGIES OF PREVENTION FOR CLINICIANS (3). Designed for those interested in the clinical arena. Establishes a framework for examining prevention activities for clinicians, and then considers a number of important health problems and the evidence for applying prevention strategies to these health problems. Encourages active student participation and involves a multidisciplinary faculty. Limited to 30 students. Fall. Harris.

PUBH 751 [251] CRITICAL APPRAISAL OF MEDICAL LITERATURE I (2). Emphasizes the process of critical appraisal of existing medical research literature, with examples from a variety of subject areas. Fall. Harris.

PUBH 752 [252] A AND B SEMINAR IN CRITICAL APPRAISAL OF MEDICAL LITERATURE (2). Emphasizes the process of critical appraisal of existing medical research literature, with examples from a variety of subject areas. Student presentations of structured critical appraisals constitute about 50 percent of sessions. Spring. Harris.

PUBH 753 [253] COMPREHENSIVE STRATEGIES IN PUBLIC HEALTH INTERVENTION: THE CASE OF TOBACCO USE REDUCTION (3). Permission of the instructor required for non-SPH majors. Using the case study of reducing tobacco consumption, this course will consider effective means of health education and health advocacy. Three lecture hours per week. Spring. Goldstein.

PUBH 756 [256] ADDRESSING HEALTH INEQUALITIES IN THE U.S. (MHCH 756) (3). Disparities in morbidity/mortality in sub-populations continue compared to other U.S. populations. Course explores contributors to inequalities and identifies strategies to counterbalance contributors to correct inequalities using public health resources. Spring. Hogan.

PUBH 760 [260] CLINICAL MEASUREMENT/EVALUATION (EPID 711) (3). Focuses on work, workplace exposures and hazards, and their effect on health. Interdisciplinary approaches to risk identification, reduction and communication will be emphasized within regulatory and ethical contexts. Online course. Spring. Rogers and Randolph.

PUBH 785 [285] INTERDISCIPLINARY APPROACHES TO OCCUPATIONAL HEALTH (3). Focuses on work, workplace exposures and hazards, and their effect on health. Interdisciplinary approaches to risk identification, reduction and communication will be emphasized within regulatory and ethical contexts. Spring. Rogers and Randolph.

PUBH 786 [286] OCCUPATIONAL SAFETY AND ERGONOMICS (ENVR 432, PHNU 786) (3). Fundamentals of occupational safety and ergonomics, with an emphasis on legislation and organization of industrial safety and ergonomic programs, including hazard recognition, analysis, control and motivational factors pertaining to industrial accident and cumulative trauma disorder prevention. Fall. Ostendorf and Wallace.

PUBH 790 [290] LEADERSHIP ASSESSMENT (2). Course is structured as a highly interactive, intensive, three-day workshop that focuses on helping participants understand their own and others' leadership styles. Self-assessment instruments and readings required in advance. Summer I. Steffen and Cocowitch.

PUBH 791 [291] CORE PRINCIPLES OF PUBLIC HEALTH LEADERSHIP (2). Course will introduce students to leadership theories and research, provide a context for leadership in public health, and help students learn core leadership skills. Online course. Fall. Steffen.

PUBH 886 [396] FIELD PRACTICUM IN PUBLIC HEALTH (3–6). The second integrative experience is a practicum or field experience. This experience will be completed after most regular course work. It is intended to provide the student an opportunity to integrate course work in a new or different type of health-related setting. The practicum cannot be only an observational experience. Rather, it must involve a project acceptable to all relevant parties. Fall, spring and summer. Staff.

PUBH 992 [392] MASTER'S PAPER (3). Permission of the instructor required. A major paper on a problem relevant to public health practice. This study may extend over more than one semester. Credit is assigned accordingly. Fall, spring and summer. Staff.

PHNU 496 [140] READINGS IN PUBLIC HEALTH NURSING (1–3). Prerequisites to be arranged with the faculty. Reading and tutorial guidance in a selected area of public health nursing or occupational health nursing. Two or more hours per week. Fall, spring and summer. Staff.

PHNU 690 [201] DELIVERY OF COMMUNITY NURSING SERVICES (3). Permission of the instructor required. Analysis of patterns of organization of community nursing services and their relationships to the health care delivery system. Special emphasis on basic management skills and their application. Staff.

PHNU 744 [244] ROLES AND FUNCTIONS IN PUBLIC HEALTH NURSING (3). Emerging roles and responsibilities of public health nurses and health departments. Emphasis on program areas in health departments and public health under health care reform. Three lecture hours per week. Summer. Harlan.

PHNU 781 [281] OCCUPATIONAL HEALTH NURSING I: OCCUPATIONAL HEALTH ASSESSMENT (3). Permission of the instructor required. Concerns factors influencing the development and operation of occupational health programs. General and special health services contingent on work environment and inherent health problems in the employed populations are considered. Fall. Rogers.

PHNU 782 [282] OCCUPATIONAL HEALTH NURSING II: OCCUPATIONAL HEALTH PROGRAMMING (3). Prerequisite, PHNU 781. Permission of the instructor required. Continuation of PHNU 781. Role components of occupational health nursing with emphasis on designing, implementing and evaluating occupational health programs. Emphasis on analysis of factors influencing the delivery of health care at the worksite. Fall. Rogers.

PHNU 783 [283] OCCUPATIONAL HEALTH NURSING: FIELD PRACTICUM I (2). Prerequisite or corequisite, PHNU 781. Permission of the instructor required. Students have the opportunity to discuss and apply concepts of OHN practice and the work environment. Concepts related to workplace hazards, interdisciplinary activities, and nursing interventions with worker aggregates are emphasized. Three to nine laboratory hours per week. Fall, spring and summer. Rogers.

PHNU 784 [284] OCCUPATIONAL HEALTH NURSING: FIELD PRACTICUM II (2). Prerequisites, PHNU 781, 783. Corequisite, PHNU 782. Permission of the instructor required. Students have the opportunity to learn about the managerial and administrative role of the OHN. Emphasis is placed on analysis of the organizational structure, external influencing factors and evaluation mechanisms. Fall, spring and summer. Rogers.

PHNU 786 [286] OCCUPATIONAL SAFETY AND ERGONOMICS (ENVR 137, ENVR 432, PUBH 786) (3). Fundamentals of occupational safety and ergonomics, with emphasis on legislation and organization of industrial safety and ergonomic programs, including hazard recognition, analysis, control and motivational factors pertaining to industrial accident and cumulative trauma disorder prevention. Fall. Ostendorf and Wallace.

PHNU 787 [287] FUNDAMENTALS OF INDUSTRIAL HYGIENE (2). Provides broad understanding of industrial hygiene. Major emphasis is recognition of hazards in the workplace, evaluation of measurement of those hazards and application of control strategies. Fall. Randolph.

PHNU 886 [396] FIELD PRACTICE IN COMMUNITY HEALTH NURSING (3–6). Permission of the instructor required. Field experience in public health nursing or occupational health nursing practice. Study and observation of selected areas related to students' program of study. Field fee, $450. Fall, spring and summer. Staff.

PHNU 993 [393] MASTER'S THESIS (3–6). Fall, spring and summer. Staff.

Department of Public Policy

www.unc.edu/depts/pubpol
RICHARD N.L. ANDREWS, *Chair*

Professors

Richard N. L. Andrews, Environmental Policy
David D. Dill, Higher Education Policy, Concepts and Principles of Policy Analysis, Ethics and Public Policy
Maryann P. Feldman, Innovation, Entrepreneurship, Higher Education and the Commercialization of Academic Research, and the Factors that Promote Technological Change and Economic Growth
Gary T. Henry, Education Policy, Child Policy, Policy and Program Evaluation, Quantitative Research Methods

Associate Professors

Daniel P. Gitterman, American Politics and Public Policy, Social and Health Policy
Sudhanshu Handa, Human Resource Economics, Poverty, Impact Evaluation, Development, Applied Microeconomics
Krista M. Perreira, Family, Health and Social Policy, Racial and Gender Disparities, Immigration

Assistant Professors

Christine P. Durrance, Public and Applied Microeconomics, Health Economics and Policy, Industrial Organization/Anti-trust Policy
Douglas L. Lauen, Education Policy, Organizational Theory, Stratification
John C. Scott, Lobbying Organizations, Social Networks, Aging and Retirement Policy

Lecturer

Gail A. Corrado, Educational Policy, Persistent Achievement Gaps Between Groups

Professors of the Practice

Anthony Brown, Leadership, Public, Nonprofit, and Social Entrepreneurship
W. Hodding Carter III, Public Policy and Leadership, the Media, the Emergent South

Adjunct Faculty

Douglas J. Crawford-Brown, Environmental Policy, Risk Analysis, Science and Technology Policy

Harvey A. Goldstein, Economic Development, Technology Policy, Design of Policy Research, Planning Theory
J. Ferrel Guillory, Southern Politics, Media and Public Life
John W. Hardin, American Politics, Public Policy, Policy Analysis
Kathleen Harris, Social Demography, Poverty, Family, Public Policy
Margaret A. Jablonski, Student Affairs, Student Learning and Development in Community
James H. Johnson Jr., Interregional Black Migration, Interethnic Minority Conflict in Advanced Industrial Societies, Minority- and Women-Owned Business Development, Workplace Diversity Issues
John D. Kasarda, Air Transport, Cargo and Logistics Policy, International Business, Economic Development, Entrepreneurship, Urban Development, Demographics
Michael I. Luger, Regional Economic Development, Technology Policy, Environmental Infrastructure and Finance, Urban Economics
Douglas E. MacLean, Practical Ethics, Moral and Political Theory, Influence of Values on Personal Decisions and Public Policies
Michael C. Munger, Policy Analysis, Statistical Methods, Political Institutions
Dennis K. Orthner, Social Psychology, Work and Family Welfare Policy
David Podoff, Social Security, Health Care Reform, Federal Budget Policy
David H. Schanzer, Immigration and Migration, National Security and Defense
Joel J. Schwartz, American Social Policy
Catherine F. Smith, Discourse Theory and Analysis, Public Policy, Democracy Education, Cultural-historical Rhetoric, Professional Discourse, Digital Composition
Charles Thompson, Educational Leadership, Policy, Research Methods

Professors Emeriti

Duncan MacRae Jr., Public Policy Analysis, Health Policy, Education Policy
Michael A. Stegman, National Housing Policy, National Urban Policy, Community Capitalism

Doctor of Philosophy

The Department of Public Policy offers the Ph.D. degree to students who wish to increase understanding of public policy problems, contribute new knowledge to the understanding of public policy decision making and institutions and develop and justify proposals for public policy solutions to societal problems. Graduates of the program are prepared to conduct sophisticated policy research that provides useful information to decision makers and to advance the bodies of knowledge both about public policy making in general and about their specific specialization field. Doctoral graduates of the Department of Public Policy hold academic positions in major universities, research positions in policy research organizations and senior policy staff positions in government agencies and other policy development organizations.

The Ph.D. in public policy combines core foundations in theory, empirical and normative analysis, public policy institutions and processes and research methods with a field specialization area that is chosen and developed by the student with the approval of an individualized doctoral program committee. The curriculum is designed to help each doctoral student develop and use appropriate analytical approaches to solve problems in public policy areas such as economic development, education, health, children and families, environment, employment, innovation and entrepreneurship, industry and international affairs.

Admission

Students are admitted to the doctoral program in public policy from diverse backgrounds in both academic preparation and experience, and such diversity is strongly welcomed. In preparation for doctoral study, applicants are encouraged to take preparatory courses in intermediate microeconomics, basic statistics and quantitative analysis (including calculus); a master's degree and some public policy-related work experience are desirable. All entering students also normally take a course in basic quantitative techniques in economics during the August before the beginning of their first semester.

Applications for admission in the fall semester are received and reviewed throughout the year. However, applications must be received by January 1 for the following fall semester to receive full consideration for Graduate School competitive awards. All prospective students must take the Graduate Record Examination (GRE), and applicants from non-English-speaking countries who do not have a degree from a U.S. institution must also submit results of the Test of English as a Foreign Language (TOEFL). Factors considered in the application review include the academic transcript, GRE scores, class rank, references, strength of undergraduate institution and statements of interest and professional experience.

Applicants are encouraged to visit the campus for a personal interview with the faculty and to meet current students in the program.

Degree Requirements

Core courses. Once enrolled, each student completes a set of doctoral-level core courses in applications of economic and institutional theory to public policy issues, as well as research design, appropriate research methods and a specialization in a particular subject area of public policy. Doctoral students are required to complete 50 hours of course work, including 23 hours in core courses common to all students and 27 hours in a self-defined policy specialization field. Core courses include PLCY 710, 716, 780, 785, 788, 789, 801 and 810. Students who have successfully completed graduate courses elsewhere that approximate these required courses may petition to have up to nine such hours counted toward the Ph.D. in public policy. Courses proposed for transfer must be approved as part of the student's program within the department, and material from those courses may be included as part of the comprehensive doctoral examinations. Students normally spend approximately two years in full-time course work, and somewhat longer if they enter the program without key prerequisite courses or a master's degree in a related field. A dissertation is required.

Policy field. Each student designs an individual course of study for a policy field. The 27 credit hour requirement gives students rigorous training in the theory, methods and subject matter of policy analysis within a substantive policy field. The specialization area course of study must include both doctoral-level understanding of the subject matter of the policy specialization area and at least nine hours of research methods, including at least six hours of quantitative methods through multivariate statistics. Students take no less than nine credit hours of courses related to the theory and subject matter of their policy concentration, plus at least three credits (in addition to the core course on institutions) on politics and policy institutions related to the policy field specialization; up to six hours of specialization area credits may be taken as independent studies. The remaining six hours of required field specialization credits are normally completed as PLCY 994 during dissertation research. The student's research methods courses should provide the student with the ability to design and carry out dissertation research, to continue making scholarly contributions in his or her chosen field and to conduct policy analyses. Each student is assisted by an individualized program committee in identifying courses, independent readings and other sources of information to acquire both the substantive knowledge and the quantitative and other analytical skills appropriate for the student's policy field specialization.

Public Policy Research Seminar (PLCY 810). The department offers a weekly seminar course in which faculty, public policy scholars, government officials and public policy doctoral students present their research and share their perspectives on policy issues. Each student is expected to enroll in this one-credit seminar for two semesters.

Professional experience. It is the policy of this program to require all Ph.D. students to have obtained practical experience in a public policy making or policy research organization in the United States by the time of their graduation. This experience may include internships or other project work for a local, state or national government, directly or through a third party (or international agency such as the World Bank) or policy research for a client. Experience gained prior to enrolling in the program may also be used to satisfy this requirement.

Graduate Minor

Doctoral and master's students not enrolled in the Department of Public Policy may elect to minor in public policy. Requirements for the minor include 16 hours of approved course work in public policy analysis for doctoral students, or 12 credits for master's students, approved by the Department of Public Policy and the student's major department. (These may not include double-counting of courses required for the student's major.) Prerequisite courses are intermediate microeconomics and probability and statistics. More information is available on the department's Web site at www.unc.edu/depts/pubpol/gradminor.htm.

Research: Faculty Expertise and Related Units

Students can tap the considerable resources of the UNC community to support a wide range of policy interests. The Department of Public Policy has developed particular strengths in five broad areas of policy research and application:

Education and Child Policy. The department has a strong and highly productive cluster of faculty research expertise in the area of education policy, including evaluation of federal and state policies for K–12 education, pre-kindergarten education and higher education. The State of North Carolina provides access available on K–12 education, and our faculty and students also have opportunities for interaction with UNC's Frank Porter Graham Child Development Institute, the James B. Hunt Jr. Institute for Educational Leadership and Policy and other nearby educational research and policy making organizations. (Related faculty: Dill, Henry, Lauen, Perreira, Thompson.)

Environmental Policy. Recent faculty and doctoral student research includes particular emphasis on state climate change and energy policies and on environmental management policies and procedures in business supply chains. The Department of Public Policy cooperates in environmental research and public service activities as well as teaching with the UNC Institute for the Environment, the Department of Environmental Sciences and Engineering, the Department of City and Regional Planning, the UNC Environmental Finance Center, the Center for Sustainable Enterprise in the Kenan–Flagler Business School and numerous other academic units with environmental interests. Chapel Hill and the Research Triangle area are two of the premier regions in the world for environmental research and policy, including multiple EPA laboratories, the National Institute for Environmental Health Sciences, Research Triangle Institute and active collaboration with state agencies as well as complementary strengths at Duke and North Carolina State University. (Related faculty: Andrews, Crawford-Brown.)

Innovation and Entrepreneurship, Economic Development and Science and Technology Policy. The department's faculty includes particular research expertise in the regional clustering of scientific knowledge, innovation and entrepreneurship, the commercialization of academic research and factors that promote technological change and economic growth. The Research Triangle region is itself internationally recognized as a premier example of knowledge-based economic development. The department also works closely with other key units on campus with strength in economic development, innovation and entrepreneurship, and science and technology policy, including the Frank Hawkins Kenan Institute of Private Enterprise, the departments of City and Regional Planning, Economics and Sociology, and the schools of Business, Government, Law and Public Health. Students have ample opportunities to work with economic development and science and technology organizations located in the region, including the Research Triangle Institute, Southern Growth Policies Board, the Rural Economic Development Center, the North Carolina Board of Science and Technology and others. (Related faculty: Dill, Feldman, Goldstein, Hardin, Johnson, Kasarda.)

Social Policy, Including Social Safety Net Policies and Low-Income Communities. The department's faculty includes particular research expertise in U.S. social safety-net policies for low-income families and retirees, needs and outcomes for immigrant youth and their families, and innovative policy incentives such as contingent cash transfer incentives in developing countries. This area of research also includes collaborative activities with the UNC Center for Community Capitalism, the Institute on Aging and the Jordan Institute of Family Policy in the School of Social Work. The Center for Community Capitalism explores ways to apply private sector approaches to revitalization of America's distressed communities, focusing on policy strategies that are both effective in building wealth and assets in disadvantaged communities and sustainable from a business perspective. The Jordan Institute for Families develops and tests policies that strengthen families and engage communities. (Related faculty: Dill, Gitterman, Handa, Harris, Johnson, Orthner, Perreira, Podoff, Schwartz, Scott.)

Health Policy. Faculty in public policy study issues relating to mental health and substance abuse, AIDS, environmental health, health insurance and managed care, and health issues in developing countries, all with a focus on achieving better health outcomes and on the economic and institutional basis of good policies. Public Policy faculty and doctoral students also collaborate with considerable expertise and resources in the School of Global Public Health, the Department of Social Medicine, the Carolina Population Center, the Cecil Sheps Center for Health Services Research, neighboring universities, contract research organizations and international donor organizations. (Related faculty: Durrance, Gitterman, Handa, Perreira, Schwartz.)

Financial Assistance

When admitted, students are automatically considered for a range of financial support, including Graduate School fellowships, teaching assistantships and research assistantships. Many awards grant full tuition privileges and medical insurance coverage, substantially increasing their value to the student. Prospective students are encouraged to contact faculty members whose research is in areas of their potential interest and experience.

Resources

The University of North Carolina at Chapel Hill has a distinguished tradition in public policy. A charter member of the Association for Public Policy Analysis and Management, the Department of Public Policy currently has an 11-member core faculty including nationally and inter-

nationally recognized expertise in policies for education, environment, health, immigrant populations, innovation and economic development, entrepreneurship, institutional design and other policy areas. Many combine scholarship with governmental experience and direct engagement in public leadership, and many also hold joint appointments in related academic units. In addition to the Ph.D., the department offers a strong undergraduate major in public policy, a graduate minor for interested students in other academic units and close cooperation with other policy-related graduate programs at both the master's and doctoral levels offered by the departments of City and Regional Planning, Environmental Sciences and Engineering, Health Policy and Administration, the Public Administration program and the schools of Business, Education, Law, Social Work and Medicine. Doctoral students in the department may also enroll in classes at Duke University (to which there is a regular bus service) as well as nearby North Carolina State University without additional cost.

Visiting Scholars

The University of North Carolina at Chapel Hill hosts visiting public policy scholars and postdoctoral research fellows from around the world and exchanges students and faculty with several universities in Europe and Asia.

Research Centers and Institutes

A wide range of University of North Carolina research centers and institutes, many of which conduct nationally and internationally distinguished policy-related research, also extend research opportunities. Examples include:

The Carolina Institute for Public Policy
Established in 2007, the Carolina Institute for Public Policy facilitates interdisciplinary collaborations on policy-relevant research among faculty and graduate students from multiple academic units, promotes opportunities for faculty and students to interact with policy makers and other public leaders on public policy questions, and serves as a broker for public policy research opportunities at the state, regional, national and international levels. The institute is located and staffed jointly with the department.

The Institute for the Environment
Organizes and supports interdisciplinary environmental science and decision-making research across and beyond the campus on global, national and North Carolina environmental problems.

Carolina Population Center
Conducts internationally distinguished research to benefit world populations, train the next generation of population scholars, build skills, capacity and improved methodologies, and disseminate data and findings to population professionals, policy makers and the public.

Cecil G. Sheps Center for Health Services Research
Conducts interdisciplinary research to improve the health of individuals, families and populations by understanding the problems, issues and alternatives in the design and delivery of health care services.

Center for Urban and Regional Studies
Conducts research on urban issues and processes of urbanization, such as new community development, housing market dynamics and national home ownership policies, models of urban growth, residential preferences, coastal zone management and planning for natural hazards.

Frank Hawkins Kenan Institute of Private Enterprise
Conducts research and technical assistance on projects to help businesses turn obstacles into opportunities and to help countries and communities identify their competitive strengths and develop innovative strategies and partnerships to achieve their goals.

Center for Community Capitalism
Conducts research to help reduce poverty and inequality by creating more effective strategies to reintegrate America's disadvantaged communities and their residents into the market economy.

Carolina Center for Competitive Economies
Conducts applied research and policy analysis to help address problems of economic competitiveness, primarily within the state of North Carolina. C3E is a pan-University activity and is housed in the Kenan Institute for Private Enterprise.

Howard W. Odum Institute for Research in Social Science (IRSS)
The oldest institute in the United States for the cooperative study of problems in the general field of social sciences; maintains extensive survey and census archives and assists in design and analysis of social research.

Frank Porter Graham Child Development Institute
Pursues research to create new knowledge to enhance the lives of children and their families.

Highway Safety Research Center
Conducts research on prevention of collisions and injuries for state and local highway safety agencies.

Institute for Transportation Research and Education
Provides highway and transportation engineering research and technology transfer to local, state and federal government agencies.

Jordan Institute for Families
Created in 1996 in the School of Social Work, the Jordan Institute promotes research and development efforts to improve the quality of services delivered to communities across the state and nation. It maintains four basic missions: 1) to facilitate faculty research, 2) to provide opportunities for students to work on research and development projects in the areas of human services, 3) to build professional relationships with research laboratories and centers across the campus and 4) to serve as a resource to human service departments and programs in North Carolina.

School of Government
Provides teaching, research and consultation to North Carolina state and local government officials.

Water Resources Research Institute
Formulates research programs responsive to state water resource problems. Provides local, state and federal agencies with research to make better decisions in managing water resources.

For more information, contact Admissions, Department of Public Policy, CB #3435, Chapel Hill, N.C. 27599-3435. Telephone: (919) 962-1600. E-mail: lcarrier@email.unc.edu. Web site: www.unc.edu/depts/pubpol.

Courses for Graduates and Advanced Undergraduates

460 [175] QUANTITATIVE ANALYSIS FOR PUBLIC POLICY (3). Prerequisite, STOR 155 or equivalent. Application of statistical techniques, including regression analysis, in public policy program evaluation; research design; and data collection and management. Fall and spring. Handa, Lauen.

470 BUSINESS, COMPETITION AND PUBLIC POLICY (3). This course focuses on competition policy in the United States using relevant Supreme Court decisions as well as economic and policy-related motivation for specific business behavior. Some of the topics include public and private enforcement of the antitrust laws, market power and market definition, predatory pricing, collusion, price discrimination and other special topics. Spring. Durrance.

480 [120] ENVIRONMENTAL DECISION MAKING (ENST 480) (3). Introduces factors shaping environmental decision making by individuals, businesses, governments, advocacy groups and international institutions. Explores public policy incentives and action strategies for influencing them. Spring. Andrews.

490 SPECIAL TOPICS IN PUBLIC POLICY (3). Special topics in public policy for undergraduate and graduate students. Fall or spring. Staff.

496 INDEPENDENT STUDY/READING IN PUBLIC POLICY (1–6). By special arrangement and permission of the instructor. Independent reading in public policy. Fall or spring. Staff.

499 SELECTED TOPICS IN PUBLIC POLICY (3). Selected topics in public policy. Fall or spring. Staff.

510 [183] POLICY ANALYSIS OF GLOBAL CLIMATE CHANGE (ENST 510) (3). Provides a real-world and relevant case study in which to apply material from multiple disciplines including public policy, economics, environmental science and international studies. Teaches techniques for building policy models not covered elsewhere. Fall or spring. Staff.

520 ENVIRONMENT AND DEVELOPMENT (ENST 520, INTS 520) (3). Reviews environmental problems in developing countries. Analyzes proposed solutions, such as legal remedies, market instruments, corporate voluntary approaches, international agreements and development policies. Discusses the link between trade and environment, environmental cases from the World Trade Organization and sustainable development. Fall or spring. Staff.

Courses for Graduates

526 PRINCIPLES OF PUBLIC FINANCE FOR PUBLIC POLICY AND PLANNING (PLAN 526) (1.5). Provides the foundation of state and local government finance necessary to understand new developments in the provision of infrastructure for economic development. Spring. Staff.

527 APPLIED PUBLIC FINANCE FOR INFRASTRUCTURE AND ECONOMIC DEVELOPMENT (PLAN 527) (1.5). Explores the role of infrastructure in economic development, including innovations in finance, management and technology. Covers traditional and knowledge infrastructure. Addresses trade-off between environmental protection and economic growth. Spring. Staff.

530 EDUCATIONAL PROBLEMS AND POLICY SOLUTIONS (3) A critical review of current debates and policy solutions in education. Topics analyzed through three of the most commonly used evaluative criteria in policy analysis: equity, efficiency and effectiveness. Topics covered include equality of educational opportunity, racial segregation, the black-white test score gap, school choice and the use of student and teacher incentives to promote increased performance. Lecture, case studies, discussion. Fall or Spring.. Lauen.

585 [185] AMERICAN ENVIRONMENTAL POLICY (ENST 585, ENVR 585, PLAN 585) (3). Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, and instruments, policy analysis and major elements of American environmental policy. Lectures and case studies. Fall. Andrews.

590 SPECIAL TOPICS IN PUBLIC POLICY (3). Special topics in public policy for undergraduate and graduate students. Fall or spring. Staff.

596 INDEPENDENT STUDY/READING IN PUBLIC POLICY (1–6). By special arrangement and permission of the instructor. Independent reading in public policy. Fall or spring. Staff.

599 SELECTED TOPICS IN PUBLIC POLICY (3). Selected topics in public policy. Fall or spring. Staff.

686 [186] POLICY INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT (ENST 686, ENVR 686, PLAN 686) (3). Prerequisite, ECON 410 or PLAN 710, or equivalent. Design of public policy instruments as incentives for sustainable management of environmental resources and ecosystems, and comparison of the effects and effectiveness of alternative policies. Spring. Andrews.

690 SPECIAL TOPICS IN PUBLIC POLICY (3). Special topics in public policy for graduate or undergraduate students. Fall or spring. Staff.

696 INDEPENDENT STUDY/READING IN PUBLIC POLICY (1–6). By special arrangement and permission of the instructor. Independent reading in public policy. Fall or spring. Staff.

698 [094] PRACTICUM IN PUBLIC POLICY (3). Prerequisite, PLCY 460. For senior public policy majors and other seniors having a strong background and/or interest in analysis of public policy. The course involves an in-depth analysis of a public policy problem by each member of the class. Fall and spring. Corrado.

699 SELECTED TOPICS IN PUBLIC POLICY (3). Selected topics in public policy.

701 [204] AMERICAN POLITICAL INSTITUTIONS (POLI 701) (3). Theory and practice of political institutions in the American context. Fall and spring. Staff.

710 [205] PUBLIC POLICY ANALYSIS (3). The roles of expertise in policy discourse; the place of values in policy analysis; summarizing preferences; benefits and costs; policy models; policy expertise and democratic political systems. Fall. Feldman, Perreira.

716 [216] NEW INSTITUTIONALISM: POLITICS, INSTITUTIONS AND PUBLIC POLICY (POLI 716) (3). Examines leading theoretical approaches to study institutions and public policy. Draws on "new institutionalism" scholarship from political science, economics and sociology to analyze public policy in historical and comparative perspectives. Emphasis on applying these theoretical insights to substantive public policy issues. Spring. Gitterman, Scott.

731 [701] SOCIAL WELFARE POLICY (SOWO 731) (3). Prerequisite, doctoral standing or permission of the instructor. Review of developments in United States welfare policy and economic, social and political forces undergirding reform initiatives since the 1960s. Analysis of data on impacts of welfare policies and programs. Orthner.

761 [260] COMMUNITY DEVELOPMENT VENTURE (MBA 850) (1.5). Seminar explores community capitalism perspectives, with emphasis on capital formation and innovations in community development finance and business-driven investment strategies. Spring. Staff.

768 [258] SEMINAR IN COMMUNITY CAPITALISM (PLAN 768) (3). Limited to graduate students. Reflects the convergence of business and community development interests. Seminar explores theory and applications in inner city business and capital markets, development finance and urban policies. Requires major research project. Fall. Staff.

780 [231] NORMATIVE DIMENSIONS OF POLICY ANALYSIS AND RESEARCH: THEORIES, METHODS AND ETHICAL FOUNDATIONS (3). Ethical considerations are integrated with formal analytical approaches in policy advising. Topics include criteria for policy choice, user participation and analysts' obligations in political situations. First semester: noneconomic techniques. Fall. Staff.

785 [232] PUBLIC INVESTMENT THEORY AND TECHNIQUES (PLAN 785, ENVR 785) (3). Theory and techniques of public investment planning and cost-benefit analysis involving synthesis of economic, political and technologic aspects. Special focus on project and program evaluation in the Third World. Spring. Staff.

787 [233] ETHICS AND FORMAL ANALYTIC TECHNIQUES II (3). Ethical considerations are integrated with formal analytical approaches in policy advising. Topics include criteria for policy choice, user participation and analysts'

obligations in political situations. Second semester: mainly cost-benefit analysis. Spring. Staff.

788 [288] ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY I (PLAN 788) (3). Economic theory applied to policy issues. Policy issues analyzed require microeconomic theory, including theory of utility and demand, organization and operation of product and factor markets, production theory, regulation and welfare economics. Fall. Durrance, Handa.

789 [289] ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY II (PLAN 789) (3). Prerequisite, PLCY 788. Additional public policy issues addressed to study further applications of economic theory. Issues require knowledge of risk and uncertainty, fiscal and monetary theory, and macro income determination. Spring. Durrance, Handa.

799 SELECTED TOPICS IN PUBLIC POLICY (Var.). Fall and spring. Staff.

801 [301] DESIGN OF POLICY-ORIENTED RESEARCH (PLAN 801) (3). Logic of designing research for the analysis of planning problems and the formulation of public policies. Elements of research design, case study, survey research, quasi-experimental designs and the social experiment are covered. Fall. Henry.

802 [302] ADVANCED SEMINAR IN RESEARCH DESIGN: DATA, METHODS AND EVALUATION (PLAN 802) (3). Prerequisite, PLCY 301. Three main objectives: to deepen students' understanding of important issues and topics in the design of empirical research, to further develop students' ability to critically evaluate research designs and policy-related products and to aid in developing a research paper, dissertation or other product. Spring. Henry.

805 [298] PUBLIC POLICY WORKSHOP (1–3). For graduate students in public policy analysis who are undertaking team projects under faculty supervision. Projects vary from year to year. All will relate to public policy and will involve interaction with real clients. The intent is to provide students with an opportunity to apply theory and techniques of policy analysis in actual problem situations. Fall and spring. Staff.

810 [310] PUBLIC POLICY SEMINAR (1). Weekly forum for public policy scholars and officials to discuss the relationships between policy research and policy outcomes. Presentations by invited speakers and doctoral students. Fall or spring. Staff.

820 [220] AMERICAN WELFARE STATE (3). This course will examine the American welfare state through a wide-ranging investigation of the origins, development and future of the most critical features of U.S. politics, social policy and law. Spring. Gitterman.

892 [353] PH.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (ENVR 892, PLAN 892) (3). Prerequisites, doctoral standing and permission of the instructor. Ph.D. seminar on theory, methods and current research and literature in environmental management and policy. One to two seminar hours per week. Fall or spring. Andrews.

895 [295] TOPICS IN POVERTY AND HUMAN RESOURCES (3). Topics covered include poverty, welfare and human resources from an economic perspective. For students wanting to specialize in social and behavioral approaches to the study of population and demographic phenomena. Spring. Handa.

901 [299] INDEPENDENT STUDY (Var.). This course allows graduate students in public policy analysis to receive credit for work on individual projects, designed in conjunction with a faculty supervisor. It is intended for students who are interested in pursuing academic topics not covered in scheduled courses. Fall and spring. Staff.

910 [300] THE USE OF RESEARCH IN THE POLICY PROCESS (3). Systematically examines use and abuse of policy-relevant research in policy process; connects design and execution of policy research with participants in policy process; policy cases are emphasized. Fall. Staff.

955 [355] SEMINAR IN ECONOMIC DEVELOPMENT AND SCIENCE AND TECHNOLOGY POLICY (3). Prerequisites, doctoral standing and permission of the instructor. Explores current issues in economic development and science and technology policy through a series of scholarly presentations and student research projects. Spring. Staff.

994 [394] DOCTORAL DISSERTATION (Var.). Fall, spring and summer. Staff.

Division of Rehabilitation Counseling and Psychology

www.alliedhealth.unc.edu/rcp

CHARLES P. BERNACCHIO, *Director*

Clinical Professor

Donna Falvo, Medical and Psychosocial Aspects of Chronic Illness and Disabilities; Aging and Disability

Associate Professor

Eileen J. Burker (22) Behavioral Medicine/Health Psychology; Religiosity, Spirituality and Quality of Life Associated with Heart and Lung Transplantation; Psychological Aspects of Cardiac and Pulmonary Rehabilitation

Assistant Research Professors

Charles P. Bernacchio, Psychiatric Rehabilitation Practice, Supported Employment, Aging with a Disability, Universal Design for Learning, Clinical Supervision and Transition of Youth with Disabilities

Kelly A. Kazukauskas, Developmental Disability Practice, Disability and Sexuality, Rehabilitation Counselor Competency and Training, Aging and Mental Health Issues in Persons with Developmental Disability

The Division of Rehabilitation Counseling and Psychology (DRCP) of the Department of Allied Health Sciences offers a two-year graduate program leading to the master of science degree.

The graduate courses offered in rehabilitation counseling and psychology (RCP) present and discuss theoretical constructs and their application to clinical practice; study the bio-psychosocial complexity of disability within rehabilitation contexts; examine professional role and identity within ethical guidelines of practice; stimulate critical, analytical and creative thought; and prepare students for professional rehabilitation counseling practice including specialty settings for people with developmental and/or psychiatric disabilities.

Mission

The mission of the Division of Rehabilitation Counseling and Psychology is to serve the people of North Carolina by educating rehabilitation counselors with the knowledge and expertise to provide services to our citizens with disabilities with an emphasis on those with psychiatric and/or developmental disabilities. The mission is based on the fundamental belief in the dignity and worth of all people and the rights of people with disabilities to live self-determined lives in inclusive communities of their choice. The Division of Rehabilitation Counseling and Psychology seeks to educate rehabilitation counselors who use the counseling relationship and skills to work collaboratively with individuals to maximize functional capacity, productive and independent living skills and quality of life, and to provide access to and manage personalized services to support the unique needs and preferences of each individual, his or her family, and community. Fundamental to this is a focus on the whole person—psychological, vocational, spiritual and physical aspects—as well as family, social, work and community relationships. The division seeks to educate rehabilitation counselors who possess the knowledge, critical thinking abilities, commitment to

independent learning and scholarship, vision and courage required to forge new models of community practice to address the diverse needs of the individuals with disabilities now and in the future.

In carrying out this mission the faculty of the division has the obligation to acquire, discover, preserve, synthesize and transmit knowledge, to be models of professional leadership and to create a culture of educational excellence that will nurture students' intellectual and ethical development. Students have the responsibility to fully engage in an educational process of research, free inquiry and personal responsibility and to become foremost practitioners, scholars, researchers and leaders in the profession of rehabilitation counseling.

The University of North Carolina at Chapel Hill is recognized nationally and internationally as a leading center of scholarship, research and creative work with a mission to serve the people of North Carolina and the nation. The mission of the University's Division of Rehabilitation Counseling and Psychology is to contribute actively and substantively to this tradition.

Objectives

Graduates of the Rehabilitation Counseling Psychology Program will

1. Effectively apply current best practices in rehabilitation counseling within a community-inclusion model
2. Accurately assess the rehabilitation preferences and needs of people with disabilities and work in partnership with consumers to provide the appropriate rehabilitation counseling, services and supports needed
3. Acquire specific knowledge and skills to address the counseling and case management needs of people with disabilities, with particular emphasis on strategies and techniques for serving people with psychiatric and developmental disabilities
4. Work collaboratively with professionals, family members, community providers, employers, and agency policy and decision makers to achieve optimal rehabilitation outcomes for people with disabilities
5. Engage in a process of lifelong learning, collaboration and collegiality as part of ongoing professional development as rehabilitation counselors
6. Have the necessary leadership, business and management and public policy skills to assume leadership roles in the practice and the profession of rehabilitation counseling and
7. Promote and support consumer empowerment and self-advocacy of people with disabilities

Students must successfully complete 64 semester hours of required course work, submit and defend an approved master's thesis, paper or project, and complete an approved practicum and internship.

Requirements for Admission

- A bachelor's degree from an accredited college or university
- A grade point average of B (3.0 on a 4.0 scale) or better in the area of the major
- Submission of Graduate Record Examination (GRE) scores (any two areas of Quantitative, Verbal, or Writing scores @ 50th percentile);
- Three letters of recommendation
- Completion of application supplement for RCP within graduate school application
- Pre-admission interview with DRCP faculty

Courses for Graduates

700 [200] INTRODUCTION TO REHABILITATION COUNSELING AND PSYCHOLOGY (3). This course will cover topics germane to the history and philosophy of rehabilitation. Students will obtain an overview of the field, its consumers, and methods of service delivery. Fall. Bernacchio.

702 [202] THEORIES OF COUNSELING APPLIED TO REHABILITATION (3). An introduction to the traditional theories of individual and family counseling. Emphasis on application of theories to persons with disabilities, ethics and multicultural awareness. Fall. Kazukauskas.

704 [204] MEDICAL ASPECTS OF REHABILITATION (3). Functional, psychological, vocational, familial, social and sexual aspects of medical disabilities. Includes the human body system and medical terminology. Focus on assistive technology and functional capacity. Spring. Falvo.

706 [206] TESTS AND MEASUREMENT IN REHABILITATION COUNSELING PSYCHOLOGY (3). This course is an overview of the selection, administration and interpretation of major assessment tools. Emphasis is on persons with mental illness or developmental disabilities. Fall. Kazukaukas.

708 [208] COMMUNITY INTEGRATION FOR INDIVIDUALS WITH DISABILITIES: WORK, HOME AND LEISURE (3). This course will cover career development and counseling with emphasis on community integration in vocational and leisure pursuits of persons with disabilities, particularly those with mental illness and developmental disabilities. Spring. Bernacchio.

710 [210] DEVELOPMENTAL COUNSELING THROUGH THE LIFE SPAN (3). Developmental theories and counseling through the life span will be covered with overall themes of positive development, resiliency and healthy life transitions of persons with disabilities. Fall. Kazukauskas

712 [212] FUNDAMENTALS OF REHABILITATION COUNSELING AND PSYCHOLOGY: DIAGNOSIS AND PRACTICE IN PEOPLE WITH MENTAL ILLNESS AND DEVELOPMENTAL DISABILITIES (3). Prerequisites, RPSY 700 and 702. An introduction to diagnosing clients with mental illness and developmental disabilities. Focus is on best practice treatment and the vocational, social and familial implications of living with a DSM disorder. Fall. Burker.

714 [214] PRINCIPLES OF GROUP COUNSELING IN REHABILITATION PSYCHOLOGY AND COUNSELING (3). Strategies and techniques in developing and implementing groups in counseling. Attention to group counseling with persons with disabilities, specifically those with mental illness and developmental disabilities. Spring. Burker.

718 CO-OCCURRING DISORDERS IN REHABILITATION COUNSELING AND PSYCHOLOGY (3). Introduces occurrence of both psychiatric conditions and substance abuse prevalence examining history including traditional recovery models, contradictory practices, bio-physiological effects and shift from separate to parallel to integrated treatment approaches. Spring. Staff.

800 [300] REHABILITATION COUNSELING AND PSYCHOLOGY RESEARCH AND PROGRAM EVALUATION (3). Prerequisites, RPSY 700 and 702. Research methods, evidence-based practice, and ethical, legal and cultural issues related to research and evaluation. Covers basic statistics, library research for rehabilitation related information, proposal development and grant writing. Spring. Burker.

801 REHABILITATION COUNSELING AND PSYCHOLOGY PRE-PRACTICUM (2). Orientation to the clinical portion of the rehabilitation counseling curriculum. Includes training in assessing lethality, identifying and reporting abuse, counselor safety, rehabilitation counseling ethics and HIPAA review. Summer. Falvo.

802 [302] REHABILITATION COUNSELING AND PSYCHOLOGY PRACTICUM (5). Prerequisites, all rehabilitation counseling and psychology first-year didactic courses. Direct experience with clients/patients in varied service delivery settings. Fall. Staff.

806 [306] APPLIED COUNSELING SKILLS IN REHABILITATION COUNSELING AND PSYCHOLOGY (5). Designed to teach foundational counseling skills that will enable students to begin counseling. Focus on counseling individuals with mental illness and developmental disabilities. Includes ethics and multicultural awareness. Spring. Burker.

808 [308] EXECUTIVE LEADERSHIP IN REHABILITATION COUNSELING AND PSYCHOLOGY (3). Examines leadership in RCP practice within complex political, economic and service environments, emphasizing supervision, team coordination, public policy and funding. Emphasis on North Carolina service delivery systems. Fall. Falvo.

810 [310] INTERNSHIP IN REHABILITATION COUNSELING AND PSYCHOLOGY (12). Prerequisites, all rehabilitation counseling and psychology didactic courses including RPSY 992, 802. Direct experience with clients/patients in either developmental disability or mental illness settings. Parts 1 and 2. Summer. Falvo.

814 [314] INTRODUCTION TO REHABILITATION COUNSELING AND PSYCHOLOGY WITH PEOPLE WITH MENTAL ILLNESS AND DEVELOPMENTAL DISABILITIES (3). Historical perspective, description, diagnoses, classification, etiology, patterns of functioning, current best practices with focus on RCP service delivery and community support; day-in-the-life component included. Fall. Bernacchio/Kazukauskas.

816 [316] ADVANCED REHABILITATION COUNSELING AND PSYCHOLOGY PRACTICE WITH PEOPLE WITH DEVELOPMENTAL DISABILITIES (3). Prerequisites, RPSY 700, 702 and 814. Prepares students for RCP practice with persons with developmental disabilities; covers a wide range of intervention and coordination strategies focusing on achievement of a participatory, person-centered, independent and productive community life. Spring. Kazukauskas.

818 [318] ADVANCED REHABILITATION COUNSELING AND PSYCHOLOGY PRACTICE WITH PEOPLE WITH MENTAL ILLNESS (3). Prerequisites, RPSY 700, 702 and 814. Prepares students for RCP practice with persons with mental illness; covers a wide range of intervention and coordination strategies focusing on support of recovery and achievement of a healthy, independent and productive life. Spring. Bernacchio.

890 [304] SPECIAL TOPICS IN REHABILITATION COUNSELING AND PSYCHOLOGY (1–3). Faculty-mentored independent study to pursue specific interests and topics. Fall, spring or summer. Staff.

992 [392] MASTER'S PAPER/PROJECT IN REHABILITATION COUNSELING AND PSYCHOLOGY (3–6). Individual work by a student (supervised by faculty) to explore an area of interest in a research paper, program development or a professional project. Fall, spring and summer. Staff.

993 [393] MASTER'S THESIS IN REHABILITATION COUNSELING AND PSYCHOLOGY (3–6). Individual research supervised by a faculty member in a special field of study. Fall, spring and summer. Staff.

Department of Religious Studies

www.unc.edu/depts/rel_stud
LAURIE MAFFLY-KIPP, *Chair*
RANDALL STYERS, *Interim Chair (Fall 2008)*

Professors

Yaakov S. Ariel (48) Judaism and Evangelical Christianity in America, Messianic Movements and Missions, Christian-Jewish Relationship
Jonathan Boyarin (63) Jewish Identity, Politics of Memory, Comparative Diaspora
Bart D. Ehrman (19) New Testament, Early Christianity
Carl W. Ernst (42) Islamic Studies, Sufism, South Asia
Peter I. Kaufman (16) History of Christian Traditions; Patristic, Medieval and Reformation Studies
Jodi Magness (54) Archaeology of the Qumran and the Dead Sea Scrolls, Ancient Synagogues
Ruel W. Tyson Jr. (13) Philosophy and Anthropology of Religion, Ethics and Rhetoric

Associate Professors

Laurie Maffly-Kipp (29) History of Religion in America, African American Religion
Zlatko Plese (49) Religion in Late Antiquity, Greco-Roman Religion
Omid Safi (60) Islamic Studies, Contemporary Islamic Thought
Randall Styers (52) Critical Approaches to the Study of Religion, Modern Western Religious Thought

Assistant Professors

Barbara Ambros (57) Japanese Religions, East Asian Religions, Buddhism, Religion in Asian Diaspora Communities
Lauren Leve (56) Theravada Buddhism, Ethnographic Methods, South and Southeast Asian Religions

Adjunct Professors

Philip Gura, Religion and American Literature
Jonathan Hess, Modern Judaism
Paul W. Meyer, New Testament and Early Christianity
Albert Rabil, Renaissance and Early Modern History, Women's Studies
Tony K. Stewart, Vaishnavism and Islam in South Asia

Adjunct Associate Professor

Margaret Wiener, Indonesian Religions

Adjunct Assistant Professors

Charles Kurzman, Islamic Movements
Barry Saunders, Ritual Studies and Biomedicine

Professors Emeriti

John W. Dixon Jr.
William J. Peck
David Halperin
James H. Sanford
Jack M. Sasson
John H. Schutz
John Van Seters

The graduate program in religious studies at the University of North Carolina at Chapel Hill deals with religion both as a distinctive human experience and as a mode of culture and history. Both orientations define religion as a broad area of human existence, and students are encouraged to explore the tension between those two general approaches. The interests of the department's faculty express the variety of methodological orientations in such study, and faculty members in other departments of the University offer strong interdisciplinary support.

The Graduate School of the University offers two degrees in religious studies, the master of arts and the doctor of philosophy. The M.A. program introduces students to the general problems and methods in the study of religion. Specific requirements include:

- 30 hours of course credit, including RELI 700 and one "gateway" course
- Two written comprehensive examinations, one in the general field of religion and one in a specialty field;
- A thesis of three to six credits and an oral defense and
- Demonstrated competence in French or German

The doctoral program is primarily intended to prepare students for a career in university and college teaching and research in religious studies. It currently offers specialization in ancient Mediterranean religions, Islamic studies, medieval and early modern studies, religion in the Americas, religion and culture, and religions of Asia.

Ph.D. students should expect to take at least 18 hours course work beyond the M.A. level. Other requirements in the doctoral program include

- Completion of requirements in one of the specialty fields noted above
- Written and oral qualifying examinations specific to the field of specialization
- Demonstrated reading competence in French and German and
- A dissertation (and an oral defense of the dissertation)

For further information, write to the Director of Graduate Studies, Department of Religious Studies, CB# 3225, 125 Saunders Hall, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3225; e-mail: religion@unc.edu. Also see the department's Web site at www.unc.edu/depts/rel_stud.

Courses for Graduates and Advanced Undergraduates

401 [113] BIBLICAL HEBREW (3). Introduction to the grammar and exegesis of biblical Hebrew. Staff.

402 [114] BIBLICAL HEBREW (3). Prerequisite, RELI 401 or permission of the instructor. Continuation of RELI 401. Staff.

403 [115] INTERMEDIATE CLASSICAL HEBREW (3). Readings in biblical, Mishnaic and medieval poetry and prose. Staff.

404 [116] INTERMEDIATE CLASSICAL HEBREW (3). Continuation of RELI 403. Staff.

409 [119] GREEK NEW TESTAMENT (GREK 409) (3). Prerequisite, GREK 222 or equivalent. Staff.

410 [224] ARAMAIC/RABBINIC HEBREW (3). Prerequisites, RELI 403 and 404, or permission of the instructor. Reading texts in rabbinic Hebrew or in Biblical and/or Talmudic Aramaic, with appropriate grammatical instruction. Staff.

411 [220] ADVANCED AKKADIAN (3). Prerequisites, RELI 403 and 404. Readings in literary, epistolary and juridical texts. Staff.

412 [222] UGARITIC (3). Prerequisites, RELI 403 and 404. Readings in the alphabetic texts of Ras Shamra and a study of the elements of Ugaritic grammar. Staff.

413 [112] BIBLICAL COPTIC AND EARLY EGYPTIAN MONASTICISM (3). Permission of the instructor. Coptic, the last stage of Egyptian, a living language in the Roman and Byzantine period. Thorough grounding in grammar of the Sahidic dialect as a basis for reading biblical monastic and Gnostic texts. Staff.

421 RELIGION AND SCIENCE (3). This course explores the complex relation between religion and science in the modern world. Public disputes over teaching evolution in American schools serve as a central case study of this. Staff.

422 [107] TOPICS IN PHILOSOPHICAL PROBLEMS IN RELIGION (3). Prerequisite, senior or graduate standing or permission of the instructor. Topic varies. Staff.

423 [156] ETHNICITY, RACE AND RELIGION IN AMERICA (3). Prerequisite, RELI 140 or permission of the instructor. A theoretical inquiry into ethnicity, race and religion as constituents of personal and communal identity. Emphasis on global migrations, colonial and postcolonial relations, diasporic communities and issues of religious pluralism. Staff.

424 [182] GENDERS AND THEORIES IN THE STUDY OF RELIGION (WMST 424) (3). An examination of contemporary gender theory, with particular focus on its application to the study of religion. Staff.

425 [036] PSYCHOLOGY OF RELIGION (3). A critical exploration of the concept of religious experience as defined by such authors as William James and Sigmund Freud. Staff.

428 [142] RELIGION AND ANTHROPOLOGY (ANTH 428, FOLK 428) (3). Religion studied anthropologically as a cultural, social, psychological phenomenon in the works of classical and contemporary social thought. Staff.

429 [190] RELIGION AND SOCIETY (SOCI 429) (3). Sociological analysis of group beliefs and practices, both traditionally religious and secular, through which fundamental life experiences are given coherence and meaning. Staff.

438 [130] RELIGION, NATURE AND ENVIRONMENT (ANTH 438) (3). A seminar on concepts of nature within religions and a variety of worldwide spiritual traditions. Emphasis on sacred space, place and pilgrimage as a vital intersection of religion and nature. Staff.

440 [140] STUDIES IN AMERICAN RELIGION (3). Permission of the instructor. A consideration of varying topics from intellectual, literary, social and cultural dimensions of American religion. Staff.

441 [148] HISTORY OF RELIGION IN AMERICA TO 1865 (3). An examination of primary sources in the history of American religion from the precolonial era to the Civil War. Staff.

442 [149] HISTORY OF RELIGION IN AMERICA SINCE 1865 (3). An examination of primary sources in the history of American religion since the Civil War. Staff.

443 [153] EVANGELICALISM IN CONTEMPORARY AMERICA (3). Prerequisite, junior or senior standing. Examination of evangelicalism and its role in American society, politics and culture. Exploration of its various subdivisions and its relation to such movements as fundamentalism, pentecostalism, revivalism and premillennialism. Staff.

444 [154] GENDER AND SEXUALITY IN CONTEMPORARY JUDAISM (JWST 444) (3). The seminar examines the developments in gender roles and in sexuality in contemporary Judaism. Staff.

445 [155] ASIAN RELIGIONS IN AMERICA (ASIA 445) (3). A study of intercultural interaction and interreligious encounter focusing on Asian religions in America, 1784 to the present. Staff.

454 THE REFORMATION (HIST 454) (3). Examines a movement of religious reform that shattered Latin Christendom and contributed many of the conditions of early Modern Europe. Emphases: religious, political, social. Staff.

463 [465] MEDIEVAL SLAVIC CULTURE (SLAV 463) (3). Survey of medieval Slavic culture, beginning with Christianization in the ninth and 10th centuries. Themes include Byzantine missions, the replacement of paganism with Christianity, the oral traditions and Slavic literary relations. Readings in English for nonSlavic concentrators. Staff.

480 [086] MODERN MUSLIM LITERATURES (3). Stresses the diversity of modern Islamic experience by examining the works of various Muslim authors. Genres may include travelogues, memoirs, novels, sermons and treatises, among others. Staff.

481 RELIGION, FUNDAMENTALISM AND NATIONALISM (PWAD 481) (3). An exploration of explosive combinations of religion and politics in the Iranian revolution, the Palestinian movement, Hindu nationalism in India and Christian fundamentalism in America. Staff.

487 MOUNTAINS, PILGRIMAGE AND SACRED PLACES IN JAPAN (ASIA 487) (3). This course explores the role that mountains and pilgrimage have played in Japanese cosmology and how they relate to methodology of studying place and space. Staff.

488 SHINTO IN JAPANESE HISTORY (ASIA 488) (3). This course discusses the development of Shinto in Japanese history and covers themes such as myths, syncretism, sacred sites, iconography, nativism, religion and the state, and historiography. Staff.

490 [161] SELECTED TOPICS IN THE STUDY OF ASIAN RELIGIONS (3). Permission of the instructor. A close examination of a selected topic in Asian

religions. Staff.

502 [121] MYTHS AND EPICS OF THE ANCIENT NEAR EAST (FOLK 502) (3). Permission of the instructor. An examination of Babylonian, Canaanite, Egyptian, Hittite and Sumerian texts from the prebiblical era, focusing on representative myths, epics, sagas, songs, proverbs, prophecies and hymns. Staff.

503 [122] EXPLORING THE DEAD SEA SCROLLS (JWST 503) (3). A comprehensive introduction to the Dead Sea Scrolls and the different Jewish groups connected with them. Staff.

512 [111] ANCIENT SYNAGOGUES (CLAR 512, JWST 512) (3). Prerequisite, RELI 110 or permission of the instructor. This is a course on ancient synagogues in Palestine and the Diaspora from the Second Temple period to the seventh century A.D. Staff.

522 [186] 19TH-CENTURY CRITIQUES OF RELIGION (3). Permission of the instructor. An exploration of influential 19th-century critiques of religion, including texts by such thinkers as Feuerbach, Marx, Kierkegaard, Nietzsche, Stanton, Douglass and Freud. Staff.

524 ETHNOGRAPHIC APPROACHES TO CONTEMPORARY RELIGION (3). Considers key ethical, epistemological and methodological problems in the ethnographic study of contemporary religion(s). Explores innovations in project design, research and textual strategies through the lens of exemplary new works. Staff.

525 [311] SEMINAR IN RELIGION AND LITERATURE (3). Seminar topic varies. Staff.

528 [187] RITUALS AND RHETORICS OF RELIGION (3). An examination of ritual, allegory and symbol as modes of religious expression in cultic and literary contexts. Staff.

534 [191] RELIGIOUS ETHICS AND ISSUES IN CONTEMPORARY MEDICINE (3). Prerequisite, senior or graduate standing. Examination of religious-ethical dimensions of such issues as the dying patient, organ transplants, abortion, prolongation of life and experimentation on human beings, drawing on theory from the traditional Western religions and the social sciences. Staff.

540 [152] MORMONISM AND THE AMERICAN EXPERIENCE (3). Prerequisite, RELI 140 or permission of the instructor. Exploration of the history, beliefs and practices of Mormons. Will include visits to Latter-Day Saints services, guest speakers and discussion of race and gender in the contemporary church. Staff.

574 [591] CHINESE WORLD VIEWS (ANTH 574, ASIA 574) (3). Explores the indigenous Chinese sciences and the cosmological ideas that informed them. Topics include astronomy, divination, medicine, feng shui and political and literary theory. Chinese sources in translation are emphasized. Staff.

580 [091] AFRICAN AMERICAN ISLAM (AFAM 580) (3). An historical examination of African American Islam in the United States. Explores the intellectual, cultural, social and political roots of black Islam in addition to its diverse doctrinal, ritual and institutional manifestations. Staff.

581 [171] SUFISM (ASIA 581) (3). Permission of the instructor. A survey of Islamic mysticism, its sources in the Qur'an and the Prophet Muhammad, and its literary, cultural and social deployment in Arab, Persian, Indic and Turkish regions. Staff.

582 [172] ISLAM AND ISLAMIC ART IN SOUTH ASIA (ASIA 582) (3). A survey of the formation of Islamic traditions in the subcontinent from the eighth century to the present, with emphasis on religion and politics, the role of Sufism, types of popular religion and questions of Islamic identity. Staff.

583 [173] RELIGION AND CULTURE IN IRAN, 1500–PRESENT (ASIA 583) (3). Iran from the rise of the Safavid empire to the Islamic Republic. Topics include Shi'ism, politics, intellectual and sectarian movements, encounters with colonialism, art and architecture, music, literature. Staff.

584 THE QUR'AN AS LITERATURE (ASIA 584) (3). A nontheological approach to the Qur'an as a literary text, emphasizing its history, form, style and interpretation. Staff.

592 [176] RELIGIOUS CONFLICT AND NARRATIVE IN INDIA (HNUR 592) (3). Historical causes of violence between Hindus and Muslims in modern India. Short stories, poetry and novels in translation used to explore how conflicts over religious sites, religious conversion, image worship and language use contributed to a sense of conflicting religious identity. Staff.

602 WHAT ARE THE HOLY SCRIPTURES? THE FORMATION OF THE HEBREW CANON (JWST 602) (3). The courses traces the canonical process that led to the Hebrew Bible and the Greek Old Testament. Historical causes of violence between Hindus and Muslims in modern India. Short stories, poetry and novels in translation used to explore how conflicts over religious sites, religious conversion, image worship and language use contributed to a sense of conflicting religious identity. Staff.

605 [110] JOSEPH—KING OF DREAMS: JOSEPH IN BIBLE AND TRADITION (3). A study of the Joseph story as preserved in Genesis 37–50 and its interpretative history in early Judaism. Staff.

607 PROBLEMS IN EARLY CHRISTIAN LITERATURE AND HISTORY (3). Prerequisite, one of the following: RELI 104, 207 or 208, or permission of the instructor. Staff.

608 [123] THE MESSIAH AND THE APOCALYPSE (3). Ideas concerning the Messiah and the end of the world held by Jews, Christians and Muslims. Emphasis on the beginning of the Christian era. Staff.

617 [129] DEATH AND AFTERLIFE IN THE ANCIENT WORLD (3). Examinations of practices and discourses pertaining to death and the afterlife in the ancient civilizations of Near East, Greece and Rome. Staff.

681 [179] READINGS IN ISLAMICATE LITERATURES (ARAB 681, ASIA 681) (3). Permission of the instructor. Study of selected religious, literary and historical texts in Arabic, Persian or Urdu. Staff.

688 [288] OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (ANTH 688, FOLK 688) (3). Permission of the instructor. Exercises (including field work) in learning to read the primary modes of public action in religious traditions, e.g., sermons, testimonies, rituals and prayers. Staff.

700 [200] PROSEMINAR IN RELIGIOUS STUDIES (3). Prerequisite, graduate standing in religious studies or permission of the instructor. A basic problems and methods course required of all graduate students in religious studies. Staff.

702 [241] RELIGION AND LITERATURE OF ISRAEL (3). A study of the religious traditions in ancient Israelite literature from the 12th through the second centuries BCE. Staff.

704 [266] READINGS IN RELIGIONS OF THE ANCIENT NEAR EAST (3). Focusing on the Mediterranean religions before Alexander, the course consists of readings of original documents in translation, illustrating theology and cult, as well as on the major history of religions interpretations. Staff.

707 [227] EARLY CHRISTIAN HISTORY AND LITERATURE (3). Prerequisite, permission of the instructor. A critical study of the history and literature of early Christianity from Paul to Irenaeus, with texts to be read in the original languages. Staff.

712 [263] EARLY JEWISH HISTORY AND LITERATURE (3). Prerequisite, permission of the instructor. An examination of the main varieties of prerabbinic Judaism: Hellenistic Judaism, apocalyptic Judaism and the Judaism of the Dead Sea Scrolls. Staff.

718 [226] READINGS IN GRECO-ROMAN RELIGION (3). Prerequisite, permission of the instructor. Opportunity for reading of ancient documents representing the more important religious trends of the Greco-Roman world. Staff.

720 [244] CRITICAL AND COMPARATIVE LINEAGES IN RELIGION AND CULTURE (3). Exploration of intellectual lineages shaping the contem-

porary study of religion and culture. Staff.

721 [247] THEORIES OF RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Studies in early modern, Enlightenment and Romantic political, philosophical and literary texts. Staff.

723 [240] CRITICAL APPROACHES TO RELIGION AND CULTURE (3). Prerequisite, graduate standing in religious studies, or permission of the instructor. Exploration of various forms of contemporary critical thought (including gender theory, critical race theory and postcolonial studies) in order to assess the value of these critical tools for the study of religion. Staff.

734 [245] STUDIES IN THE RHETORIC OF IMAGES (3). Prerequisite, permission of the instructor. Selected readings on image production, exhibition and interpretation, with consideration of different ritual and cultic settings. Staff.

735 [246] CRITICAL WORKS IN RELIGION AND LITERATURE (3). Prerequisite, permission of the instructor. Textual analysis of several theoretical and literary works dealing with selected problems in religion and literature. Staff.

740 [202] APPROACHES TO THE STUDY OF AMERICAN RELIGIONS (3). Prerequisite, graduate standing in religious studies or permission of the instructor. Consideration of methods, theories, and interpretations that have been influential in the study of American religion. Tweed.

741 [203] THEMES IN AFRICAN AMERICAN RELIGIOUS HISTORY (3). Prerequisite, graduate standing in religious studies or permission of the instructor. A historical and thematic survey of the religions of African Americans from the precolonial era to the present. Staff.

742 [204] RELIGION AND LITERATURE IN AMERICA (3). Prerequisite, graduate standing in religious studies or permission of the instructor. A study of the religious tradition in American literature from the Puritan period to the present. Staff.

743 [205] CURRENT TRENDS IN AMERICAN JUDAISM (3). The course aims at examining the current developments in American Judaism: cultural, spiritual, liturgical, as well as social and institutional. Staff.

744 [248] READINGS IN AMERICAN RELIGION TO 1865 (3). An examination of primary sources in the history of American religion from the precolonial era to the Civil War. Staff.

745 [249] READINGS IN AMERICAN RELIGION SINCE 1865 (3). An examination of primary sources in the history of American religion since the Civil War. Staff.

746 [314] THE CHRISTIAN-JEWISH ENCOUNTER IN AMERICA (3). Course examines the Christian-Jewish encounter in America from the 17th century to the present. Analyzes both theological and social interactions. Staff.

760 [207] APPROACHES TO MEDIEVAL AND EARLY MODERN STUDIES (3). Prerequisite, graduate standing in religious studies or permission of the instructor. An introduction to the problems and methods in the study of medieval and early modern religion in the West. Staff.

780 [277] METHODS IN ISLAMIC STUDIES (3). Principal topics will include the history of Islamic studies in relation to Orientalism, area studies and religious studies; problems of anti-Islamic bias and stereotypes; use of textbooks, primary sources, novels, films and the Internet; teaching the Qur'an; the Muslim presence in Europe and America; contemporary reflection on classical sources; modern Muslim thinkers; gender studies; and other related subjects. (Gateway course.) Staff.

781 ANTHROPOLOGY OF ISLAM (3). Survey of anthropological and ethnographic approaches to Muslim societies with an emphasis on the multiple cultural locations of Islam, in contrast with the Orientalist definition of Islam as a purely textual religion. Staff.

801 [305] SEMINAR IN BIBLICAL STUDIES (3). Topics vary; consult the department. Staff.

807 [306] HELLENISTIC RELIGIOUS TEXTS IN GREEK (3). Studies in Greek texts drawn from early Christianity, Judaism, and other religions of the Greco-Roman World. Staff.

808 [268] THE APOSTOLIC FATHERS (3). Prerequisites, Greek and permission of the instructor. A study of selected works of the Apostolic Fathers, including Barnabas, Ignatius and Polycarp. Staff.

809 [275] TEXTUAL CRITICISM OF THE GREEK BIBLE (3). Prerequisites, Greek and permission of the instructor. Reconstruction; application of text-critical principles. Staff.

810 [223] READINGS IN EARLY JEWISH AND CHRISTIAN APOCALYPTIC (3). Prerequisite, permission of the instructor. Readings from apocalyptic texts in the original languages. Staff.

812 [231] DIASPORA JUDAISM (CLAR 812) (3). Prerequisite, graduate standing or permission of the instructor. Seminar examines the evidence for the ancient Jewish communities of Egypt, Rome, Asia Minor and Mesopotamia. Staff.

813 [302] READINGS IN TALMUD (3). Prerequisite, permission of the instructor. An introduction to the study of the Babylonian Talmud in the original Hebrew and Aramaic, with the traditional commentaries. The emphasis is on understanding Talmudic logic. Staff.

814 [264] PROBLEMS IN RABBINIC HISTORIOGRAPHY (3). Prerequisite, RELI 712 or permission of the instructor. Examination of the methodological problems of using rabbinic materials as sources for the history of Judaism in the period after 70 CE. Staff.

817 [229] ANCIENT RHETORIC AND EARLY CHRISTIANITY (3). Prerequisite, permission of the instructor. Survey of the development of rhetorical theory and practice through the Hellenistic and Roman Period. Explores the connection between rhetorical tradition and early Christian literature. Staff.

818 [307] THE GNOSTIC SCRIPTURES (3). Prerequisite, RELI 413 or permission of the instructor. Close reading and interpretation of ancient gnostic texts found near Nag Hammadi in Egypt. Staff.

819 [262] ANCIENT PHILOSOPHY AND EARLY CHRISTIANITY (3). Prerequisite, proficiency in Greek and/or Latin. Survey of the Hellenistic schools of philosophy and their impact on early Christian theories of the universe, ethics, cultural history and salvation. Staff.

821 [310] SEMINAR IN RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Topics vary; consult the department. Staff.

823 [309] POSTCOLONIAL APPROACHES TO THE STUDY OF RELIGION (3). Prerequisite, permission of the instructor. An examination of major themes in contemporary postcolonial thought, and the application of this work to the study of religion. Staff.

835 [313] SPACE, PLACE AND RELIGION (3). This interdisciplinary graduate seminar focuses on religion, space and place in the United States. Staff.

838 TOPICS IN RELIGION AND LAW (3). This course examines selected themes in legal and social theory relating to the position of religion in contemporary American society. Staff.

840 [303] SEMINAR IN AMERICAN RELIGION (3). Topics vary. May be repeated for credit. Staff.

841 [304] RELIGION AND SOCIAL ISSUES IN AMERICA (3). Historical analysis of the relationship between religious developments and social issues in America. Topics may include economics, politics and social reform. Staff.

842 [312] RELIGION AND CULTURAL CONTACT IN AMERICA (3). Examination of religion in America through instances of intercultural contact. Topics vary. Staff.

843 [206] ROMAN CATHOLICISM IN AMERICA (3). A seminar on Roman Catholicism in the United States that also considers developments elsewhere in the Western hemisphere. Focus is on ritual practice and visual culture. Staff.

866 [269] MEDIEVAL RELIGIOUS TEXTS (3). Prerequisite, permission

of the instructor. Selected texts which illumine significant aspects of medieval religious culture are read in the original languages. Staff.

867 [270] TEXTS OF THE CATHOLIC AND PROTESTANT REFORMATIONS (3). Prerequisite, permission of the instructor. Selected texts which illumine significant aspects of the Catholic and Protestant Reformations are read in the original languages. Staff.

870 [308] METHODS AND TOPICS IN THE STUDY OF WESTERN RELIGIOUS TRADITIONS (3). Prerequisite, permission of the instructor. Exploration of one enduring issue in the history of the Western Christian tradition. The instructor selects several case studies that illustrate both the topic and the developments within traditions. Staff.

890 [299] TOPICS IN THE STUDY OF RELIGION (3). Prerequisite, graduate standing in religious studies or permission of the instructor. Topics vary. Staff.

900 [325] READINGS AND RESEARCH (3). Prerequisite, permission of the instructor. Staff.

990 PRELIMINARY PREPARATION (Var.).

993 [393] MASTER'S THESIS (3 or more). Staff.

994 [394] DOCTORAL DISSERTATION (Var.). Staff.

Department of Romance Languages and Literatures

roml.unc.edu
LARRY KING, *Chair*

Professors

French
Martine Antle (45) 20th-Century French Literature
Dominique Fisher (46) 19th-Century French Literature
James S. Noblitt, Applied Linguistics and Language Learning

Italian
Dino Cervigni (44) Medieval and Renaissance Italian Literature

Portuguese
Fred M. Clark (29) Portuguese Language and Brazilian Literature
Monica P. Rector (43) Portuguese Language and Literature

Spanish
Pablo Gil Casado (23) Contemporary Spanish Literature, Theory of the Novel.
Frank A. Domínguez (25) Medieval and Golden Age Spanish Literature, Ideology and Literature, Computer Applications in the Humanities
Dominique Fisher (46) 19th-Century French Literature
Larry D. King (36) Spanish and Romance Linguistics, Semantics and Pragmatics
Rosa Perelmuter (37) Colonial Spanish American Literature, Contemporary Spanish American Narrative

Associate Professors

French
Hassan Melehy (64) Early Modern French and Comparative Literature, Contemporary Critical Theory, Film

Italian
Ennio Rao (15) Italian Renaissance

Spanish
Lucia Binotti (47) Medieval, Renaissance, Golden Age Philology and Linguistic Thought
José Manuel Polo de Bernabé (34) 19th- and 20th-Century Spanish Drama and Poetry, Contemporary Critical Theory, Film
Alicia Rivero (38) Contemporary Spanish American Literature, Contemporary Critical Theory, Gender Issues, Literature and Science, Intellectual History

Assistant Professors

French
Philippe Barr (10) 18th-Century French Literature and Philosophy, Restif de la Bretonne, First Person Narratives, History of the Novel, Literary Theory
Ellen Welch (08) 17th-century French Literature; Colonial/Postcolonial and Transnational Approaches

Italian
Federico Luisetti (69) 20th-Century Italian Literature, Contemporary Critical Theory

Spanish
Emilio Del Valle Escalante (05) Indigenous Literatures and Social Movements, Central American Literatures and Cultures, Cultural and Postcolonial Studies
Oswaldo Estrada (04) 20th-Century Latin American Literature, Mexican and Peruvian Literatures, Theory of the Novel, New Narrative
Irene Gómez Castellano (13) 18th-Century Spanish Literature and Culture, Poetry and Visual Arts
Juan Carlos González Espitia (62) 19th-Century Spanish American Literature, Decadentism and Nation Building
Carmen Hsu (51) Golden Age Spanish Literature, Chronicle Literature of the East Indies

Professors Emeriti
Cesáreo Bandera
Angel L. Cilveti
Julio Cortés
Yves de la Quérière
I. R. Stirling Haig II
Antonio Illiano
Anthony G. Lo Ré
Catherine A. Maley
G. Mallary Masters
Edward D. Montgomery
María A. Salgado
Carol Lynn Sherman
Frederick Wright Vogler

Requirements for Advanced Degrees

The degree of master of arts is offered with a major in Romance Languages and Literatures and concentrations in French, Italian or Hispanic literature. The program for the M.A. degree is open to students holding the bachelor of arts degree or the equivalent, and whose major field of undergraduate study was normally a Romance language and literature. Students are expected to have proficiency in the Romance language and in English upon admission to the program.

The degree of doctor of philosophy is offered with a major in Romance languages and literatures. Teaching experience is an essential part of professional training. Therefore, teaching assistance or lecture instruction equivalent to at least three contact hours a week for two semesters, or until teaching competence is acquired, is required of all doctoral candidates.

Research Facilities

The Walter Royal Davis Library's Spanish, French, Portuguese and Italian collections rank in the top 20 in the nation. Romance philology is supported by the medieval and Renaissance collections in the traditional languages and by significant holdings in Provençal, Catalan, Galician, Romansch and Rumanian. The Spanish and Spanish American collections are particularly strong in medieval, Golden Age/Colonial, 19th- and 20th-century holdings. The French collection has similar

strengths in the 17th, 18th and 19th centuries and is enriched by the Charles Nodier and René Char materials. The Italian collection exhibits strength in the 19th century and the Portuguese collection in 20th-century Brazilian. These strengths are enhanced by extensive holdings in reference, specialized journals and rare books. Among the latter are a notable gathering of 20th-century first editions of French writers, a distinguished Spanish drama collection of more than 26,000 plays (many of them pre-1830 sueltas) and the Flatow Collection of Latin American Cronistas, consisting of early imprints of the discovery and conquest of the New World. A more complete description of the collections is available in the "Resources" section of the department's Web site at roml.unc.edu.

French

Courses for Graduates and Advanced Undergraduates

403 [103] ADVANCED COMPOSITION (3). Prerequisite, FREN 300. Review of advanced grammar. Exercises in translation from English into French of literary and critical materials. Free composition and training in the use of stylistic devices. Staff.

451 [140] ORIENTALIST FANTASIES AND DISCOURSES ON THE OTHER (ASIA 451, INTS 451) (3). This interdisciplinary course (literature, film, painting, music) examines the Eastern and Western encounters with and discourses on the Other from the 18th century to the present.

504 [104] CULTURAL WARS: FRENCH/U.S. PERSPECTIVES (3). This course examines the limits of universalism in today's "multicultural" France and how the European Union will affect French universalism and French resistance to identity politics. Fisher.

564 [126] HISTORY OF THE FRENCH LANGUAGE (LING 564) (3). Prerequisite, FREN 300 or permission of the instructor. The phonology, morphology and syntax of French are traced from the Latin foundation to the present. Lectures, readings, discussions and textual analysis. Spring. (Alternate years.) Staff.

565 [145] FRENCH PHONETICS AND PHONOLOGY (LING 565) (3). Prerequisite, FREN 300 or equivalent, or permission of the instructor. The study of sounds as system in modern standard French. Lecture, discussion, laboratory practice in practical phonetics according to individual needs. Spring. Staff.

566 [146] STRUCTURE OF MODERN FRENCH (LING 566) (3). Prerequisite, FREN 300 or equivalent, or permission of the instructor. Introduction to phonology, morphology and syntax of modern standard French. Application of modern linguistic theory to the teaching of French. Fall. Maley.

Courses for Graduates

601 [101X] FRENCH FOR READING I (3). French language for reading. For students with no background in French or those needing a review of grammatical structures and vocabulary in preparation for FREN 602. Fall. Staff.

602 [102X] FRENCH FOR READING II (3). Prerequisite, FREN 601 or equivalent background in French. Focus on reading French in preparation for the reading knowledge exam for graduate degrees. Passing FREN 602 satisfies the requirement for most departments. Spring. Staff.

711 [211] FRENCH NOVELISTS OF THE 20TH CENTURY (3). Evolution of the novel in France up to the nineties. Antle, staff.

712 [212] FRENCH POETS OF THE 20TH CENTURY (3). A study of the poetry of Claudel, Cubist poetry, the major Surrealists, Ponge and Michaux. Staff.

713 [213] MASTERS OF 20TH-CENTURY LITERATURE (3). Studies of a single author, a literary movement or an aesthetic movement from the Avant-garde to Postmodernism. Staff.

714 [214] FRENCH DRAMA OF THE 20TH CENTURY (3). Semiotic readings in French and Francophone theater at the crossroads of cultures from the Avant-garde to Postmodernism. Staff.

715 [215] READINGS IN FRANCOPHONE LITERATURE (3). Evolution of Francophone literature from a literary and cultural perspective (Maghreb, Africa, Caribbean Islands and Canada). Antle, Fisher.

716 [216] READINGS IN CULTURAL STUDIES (3). An examination of national and transnational identity within European culture and recent economic and ethnologic changes in Western Europe and France. Antle, Fisher.

721 [221] OLD FRENCH (3). An introductory course designed to enable students to read medieval texts with rapidity and accuracy. Phonology, morphology, semantics and syntax. Montgomery.

722 [222] FRENCH STUDIES OF THE 11TH THROUGH THE 13TH CENTURIES (3). Readings in a variety of medieval texts in light of contemporary literary theory. Montgomery.

726 [225] FRENCH FEMINIST THEORY (WMST 726) (3). An introduction to feminist literary theory, focusing on French feminist writings and their sources in psychoanalysis and poststructuralism. Anglo-American counterparts and adaptations of the French tradition are treated. Staff.

733 [233] THEATRICALITY IN THE MIDDLE AGES (3). Theatrical approaches and techniques in medieval texts. Montgomery, staff.

734 [234] 17TH-CENTURY DRAMA (3). Readings in 16th- and 17th-century French theater, Crébillon père and Voltaire. Selection of texts will be announced by the instructor. Fall. Staff.

735 [235] 18TH-CENTURY DRAMA (3). A study of the genre from Marivaux to the end of the 19th century. Staff.

737 [237] LITERARY AND CULTURAL THEORY IN FRANCE (3). A study of structuralist and poststructuralist methods in poetics, semiotics, psychoanalysis, sociology and philosophy. Fisher, Melehy.

748 [248] FRENCH LITERATURE OF THE 14TH AND 15TH CENTURIES (3). A study of literary trends of the period, with emphasis on the rise of the prose nouvelle and lyric poetry from Machaut through Villon. Montgomery.

761 [261] STUDIES IN FRENCH RENAISSANCE (3). Interdisciplinary seminar on a cultural topic or a theme through readings in literary and nonliterary texts. Melehy.

771 [271] FRENCH PROSE OF THE 17TH CENTURY (3). A study of the development of prose fiction principally through the works of D'Urfé, Cyrano de Bergerac, Sorel, Scarron, Furetière, Perrault and Mme de Lafayette. Staff.

772 [272] FRENCH POETRY OF THE 17TH CENTURY (3). Poetry from Desportes through Racan emphasizing poésie précieuse et galante, religieuse, pastorale, officielle, libertine and satirique. Works by Chassignet, Sponde, La Ceppède, Malherbe, Saint-Amant, Théophile de Viau, Maynard and Régnier. Staff.

774 [274] THE MORALISTS (3). A study of the works of Pascal, La Rochefoucauld, Bossuet, La Bruyère and La Fontaine. Staff.

781 [281] 18TH-CENTURY NOVEL (3). An array of novelists and conteurs such as Prévost, Lesage, Marivaux, Laclos, Crébillon fils, Montesquieu, Diderot, Rousseau and others. Staff.

783 [283] 18TH-CENTURY PROSE (3). Intensive study of a major 18th-century writer. Staff.

784 [284] PHILOSOPHERS OF THE ENLIGHTENMENT (3). Intellectual currents (religious, scientific, epistemological) and morals as reflected in such writers as Bayle, la Mettrie, Condillac, Helvétius, d'Holbach, the Encyclopedists and others. Staff.

793 [293] 19TH-CENTURY FRENCH LITERATURE (3). Intensive study of a single major author of the Romantic or Post-Romantic period. The subject changes from year to year among writers in the different literary genres. Fisher,

staff.

794 [294] FRENCH 19TH-CENTURY POSTROMANTIC POETRY (3). A study of the evolution of poetry and poetics in modernity beginning with Baudelaire. Fisher.

795 [295] THE FRENCH REALISTIC AND NATURALISTIC NOVEL (3). A study of major Realistic and Naturalistic novelists (Flaubert, the Goncourts, Daudet, Zola, Maupassant and Huysmans). Staff.

796 [296] FRENCH BRIEF FICTION OF THE 19TH CENTURY AND/OR 20TH CENTURY (3). A study of short narrative as a hybrid genre from a literary and cultural perspective. Staff.

830 [330] SEMINAR (3). Staff.

840 [340] SPECIAL READINGS (Var.). (For doctoral students only.) Members of the graduate faculty.

993 [393] MASTER'S THESIS (3). Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3). Research in a special field under the direction of a member of the graduate faculty. Members of the graduate faculty.

Italian

Courses for Graduates and Advanced Undergraduates

503 [103] ADVANCED COMPOSITION FOR GRADUATE STUDENTS (3). Review of advanced grammar. Composition on a variety of topics designed to enhance writing proficiency in Italian. Training in the use of stylistic devices. Staff.

511 [111] SURVEY OF ITALIAN LITERATURE AND CULTURE I (TO 1600) (3). Permission of the instructor for undergraduates. The survey is based on anthologies, with particular attention to authors and texts included in the current departmental reading lists. Rao.

512 [112] SURVEY OF ITALIAN LITERATURE AND CULTURE II (1600 TO PRESENT) (3). Permission of the instructor for undergraduates. See ITAL 511 for description.

526 [126] HISTORY OF THE ITALIAN LANGUAGE (3). Prerequisite, ITAL 204, 402 or permission of the instructor. The evolution of the Italian language from vulgar Latin. Substratum theory and the development of the various dialects. Codification of the literary standard during the Renaissance. "Questione della lingua." Rao.

Courses for Graduates

706 [206] PROSEMINAR (3). An introduction to modern Italian criticism and to current methods of research and scholarship. Bibliographic survey of basic tools and secondary literature. Guidance in preparation of papers, theses and dissertations. Staff.

731 [231] DANTE I (3). Prerequisite, graduate standing or consent of the instructor. Dante's life and works; a critical reading of the Vita Nuova and Inferno. Original texts; course taught in Italian or English.

732 [232] DANTE II (3). Prerequisite, graduate standing or consent of the instructor. Completes the critical reading of the Divine Comedy. Original texts; course taught in Italian or English.

734 [134] PETRARCH AND LYRIC TRADITION (3). A reading of Petrarch's Canzoniere within the context of previous lyric tradition and Petrarchism in Europe. Class discussion in English; readings in Italian for majors and in translation for nonmajors. Cervigni.

735 [135] BOCCACCIO AND EUROPEAN NARRATIVE (CMPL 535) (3). Boccaccio's Decameron within the context of previous narrative traditions and the subsequent development of narrative in Europe. Class discussions in English; readings in Italian for majors and in translation for nonmajors. Cervigni.

741 [141] ITALIAN LITERATURE OF THE RENAISSANCE I: THE QUATTROCENTO (3). Prerequisite, ITAL 204, 402 or equivalent. A study of the major figures of Italian Humanism, Latin and vernacular, from Salutati to Poliziano. Rao.

751 [151] ITALIAN LITERATURE OF THE RENAISSANCE II: THE CINQUECENTO (3). Prerequisite, ITAL 204, 402 or equivalent. Brief description of the literary and historical situation in the Cinquecento. Three authors studied in detail are Ariosto, Orlando Furioso, Machiavelli, Il Principe and Castiglione, Il Cortegiano. Rao.

771 [171] THE 17TH AND 18TH CENTURIES (3). Prerequisite, ITAL 204, 402 or equivalent. The Age of the Baroque, Campanella, the new genres, Tassoni. The literature of Arcadia, the Enlightenment, Goldoni, Parini and Alfieri. Luisetti.

781 [181] ITALIAN ROMANTICISM (3). Prerequisite, ITAL 204, 402 or equivalent. Preromanticism; Alfieri; the lyrics and novels of Foscolo, Leopardi, Manzoni; the Romantic drama from Pindemonte to Niccolini. Luisetti.

782 [182] ITALIAN LITERATURE IN THE SECOND HALF OF THE 19TH CENTURY (3). Prerequisite, ITAL 204, 402 or equivalent. The major literary forms in the second half of the century with particular regard to Verismo, Verga, Carducci, Pascoli, Scapigliatura and Decadentismo. Staff.

784 [194] ITALIAN AVANT-GARDES AND NEO-AVANT-GARDES 20TH CENTURY (3). Prerequisite, ITAL 204, 402 or equivalent. Examines the critical issues raised by the Italian Avant-gardes and Neo-Avant-gardes of the 20th century.

795 [195] MODERN ITALIAN FICTION (3). Prerequisite, ITAL 204, 402 or equivalent. D'Annunzio, Svevo, Moravia, Pavese, Vittorini, Calvino, etc. Luisetti.

796 [196] MODERN ITALIAN DRAMA (3). Grotteschi, Pirandello, Italian drama after World War II, Eduardo de Filippo, etc. Luisetti.

830 [330] SEMINAR (3). Special study and research in set topics; e.g., Seicento and Baroque, autobiography, Renaissance theater, literature and film. Staff.

840 [340] SPECIAL READINGS (Var.). A tutorial on a topic agreed upon by the student and a member of the graduate faculty. Members of the graduate faculty.

993 [393] MASTER'S THESIS (3). Research in a special field under the direction of a member of the graduate faculty. Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3). Research in a special field under the direction of a member of the graduate faculty. Members of the graduate faculty.

Portuguese

Courses for Graduates and Advanced Undergraduates

501 [101] SURVEY OF PORTUGUESE LITERATURE I (3). Prerequisite, PORT 204, 402 or equivalent. An introduction to Portuguese literature from its origins through the 18th century. Rector.

502 [102] SURVEY OF PORTUGUESE LITERATURE II (3). Prerequisite, PORT 204, 402 or equivalent. A survey of Portuguese literature of the 19th and 20th centuries. Rector.

503 [103] SURVEY OF BRAZILIAN LITERATURE I (3). Prerequisite, PORT 204, 402 or equivalent. A survey of Brazilian literature of the colonial period and 19th century. Clark.

504 [104] SURVEY OF BRAZILIAN LITERATURE II (3). Prerequisite, PORT 204, 402 or equivalent. Study of major writers of 20th-century Brazilian literature. Clark.

526 [126] HISTORY OF THE PORTUGUESE LANGUAGE (3). Prerequisite, PORT 402 or equivalent, or permission of the instructor. Survey of the

history of Portuguese with stress on the characteristics of Brazilian Portuguese and the factors underlying them. Rector.

535 [135] BRAZILIAN DRAMA (3). Prerequisite, PORT 402 or equivalent, or permission of the instructor. A study of representative Brazilian plays of the 20th century with a review of the development of the theater in Brazil. Clark.

Courses for Graduates

703 [203] ADVANCED COMPOSITION FOR GRADUATE STUDENTS (3). Advanced grammar with exercises in translation from English into Portuguese. Free composition and training in the use of stylistic devices. (On demand.) Clark, Rector.

704 [206] LUSO-BRAZILIAN BIBLIOGRAPHY AND METHODOLOGY (3). An introduction to bibliography and methodology in Luso-Brazilian literary and linguistic research. (On demand.) Clark, Rector.

710 [210] THE PORTUGUESE NOVEL (3). A study of prose fiction, particularly from the 19th and 20th centuries, with special emphasis on Camilo Castelo Branco, Eça de Queirós, Aquilino Ribeiro, Ferreira de Castro and the neo-realistas. Rector.

712 [212] THE BRAZILIAN NOVEL (3). Extensive reading of representative Brazilian novels from the second half of the 19th century to the present. Clark.

713 [213] MACHADO DE ASSIS (3). A study of the prose fiction, drama, poetry and criticism of Machado de Assis, with reference to other major writers of the second half of the 19th century. Clark, Rector.

714 [214] MODERN BRAZILIAN SHORT FICTION AND ESSAYS (3). A study of Brazilian short stories, novelas and essays of the 20th century. Clark, Rector.

721 [221] OLD PORTUGUESE (3). A study of Portuguese historical phonology and morphology with readings from medieval verse and prose. Rector.

731 [231] CAMÕES (3). The works of Camões (epic, lyric poetry and drama) are studied with reference to the contemporary Iberian historical and literary background. Rector.

791 [291] PORTUGUESE OVERSEAS LANGUAGE AND LITERATURE (3). A survey of the use and characteristics of Portuguese as used in Africa and Asia (especially Cape Verde creole) and readings from contemporary African authors using Portuguese. Staff.

830 [330] SEMINAR IN PORTUGUESE LITERATURE (3). Rector.

833 [333] SEMINAR IN LUSO-BRAZILIAN LINGUISTICS (3). Rector.

835 [335] SEMINAR IN BRAZILIAN LITERATURE (3). Clark, Rector.

840 [340] SPECIAL READINGS (Var.). Members of the graduate faculty.

993 [393] MASTER'S THESIS (3). Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3). Members of the graduate faculty.

Romance

Courses for Graduates and Advanced Undergraduates

604 [104] VIOLENCE AND RELIGION IN LITERATURE FROM EPIC TO NOVEL (PWAD 604) (3). Permission of the instructor. The sacred character of epic violence and its historical decline through a process of religious desacralization associated with the emergence of the modern novel. Staff.

670 [170] ROMANCE SOCIOLINGUISTICS (3). Study of language in its social context; language variation, multilingualism, social dialects, the role of culture, language and sex. Includes individual work on a specific language. King.

700 [200] THEORIES AND TECHNIQUES OF TEACHING (3). Required of all new graduate instructors. Exploration of theoretical issues in teaching Romance languages with their practical applications, including the integration of technology. Fall. Jarausch/Cowell.

751 [201] INTRODUCTION TO MEDIEVAL STUDIES (3). Interdisciplinary course to introduce graduate students to the sources, methods and approaches of medieval studies. Staff.

755 [205] WORKSHOP ON LITERARY THEORY AND RESEARCH METHODS (1.5). An introduction to contemporary theoretical positions to acquaint the student with issues posed by formalism, Marxism, feminism and deconstruction. Orientation to Romance bibliography and research methods. Staff.

820 [220] VULGAR LATIN (3). An investigation of the development of the sermo plebeius from its earliest manifestations to its fragmentation into the Romance vernaculars. Montgomery.

824 [324] ROMANCE PALEOGRAPHY (3). Study of the development of medieval romance book hands and diplomatics from their origins to the advent of printing; with practical exercises. Montgomery.

825 [225] PROVENÇAL (3). Linguistic analysis of the langue d'oc and investigation of medieval Provençal literature. Montgomery.

830 [330] SEMINAR IN ROMANCE LANGUAGES (3). Staff.

840 [340] SPECIAL READINGS (Var.). Members of the graduate faculty.

870 [370] MINOR ROMANCE TONGUES (3). Introduction to the historical development of Catalan, Rhaeto-Romance and Rumanian. Readings in period texts. Montgomery.

993 [393] MASTER'S THESIS (3). Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3). Members of the graduate faculty.

Spanish

Courses for Graduates and Advanced Undergraduates

403 [103] ADVANCED COMPOSITION (3). Prerequisite, SPAN 300. Review of advanced grammar. Compositions on a variety of topics designed to enhance writing proficiency in Spanish. Training in the use of stylistic devices. Staff.

405 [105] INTERMEDIATE SPANISH FOR HEALTH CARE PROFESSIONALS (3). Prerequisite, SPAN 102 or equivalent. Distance course requiring access to computer with DVD drive. Focuses on improving communication within the context of Latino/a immigrant culture in health care settings. Staff.

601 [101X] SPANISH FOR READING I (3). For students with no background in Spanish or those needing a review of grammatical structures and vocabulary in preparation for SPAN 602. Not for graduate credit for students in the Department of Romance Languages. Fall. Staff.

602 [102X] SPANISH FOR READING II (3). Prerequisite, SPAN 601 or equivalent background in Spanish. Focus on Spanish for the reading exam for graduate degrees. SPAN 602 satisfies the requirement for most departments. Not for graduate credit for students in the Department of Romance Languages. Spring. Staff.

610 [110] THE GENERATION OF 1898 (3). Prerequisites, SPAN 371 or 372, and 373. Study of innovative literary forms and techniques of the Generation of 1898 as seen through representative authors such as Azorín, Baroja, Machado and Valle-Inclán. Casado, Polo de Bernabé.

613 [113] COLONIAL AND 19TH-CENTURY SPANISH AMERICAN LITERATURE (3). Prerequisites, SPAN 371 or 372, and 373. Advanced survey of literary works from 16th- through 19th-century Spanish America, with emphasis on their rhetorical foundations and historical, political, and aesthetic connections. Perelmuter.

614 [114] MODERNIST AND CONTEMPORARY SPANISH AMERICAN LITERATURE (3). Prerequisites, SPAN 371 and 372 or 373. Advanced survey of Spanish American works from the 1880s through the present, with emphasis on their rhetorical foundations and historical, cultural, political and aesthetic connections. Perelmuter, Rivero.

617 [117] CERVANTES AND THE QUIJOTE (3). Prerequisites, SPAN 371 and 372 or 373. Close reading of Cervantes' Quijote and selected novelas ejemplares, with consideration of the background of Renaissance prose (romance of chivalry, pastoral and sentimental novel) in relation to 16th-century historiography. Collins, staff.

620 [120] WOMEN IN HISPANIC LITERATURE (WMST 620) (3). Prerequisites, SPAN 371 or 372, and 373. The image of woman in 16th- and 17th-century Hispanic literature. A study of texts by Spanish and Spanish American authors. Readings in Spanish or in English translation. Lectures in English. Perelmuter.

635 [135] MODERN SPANISH DRAMA (3). Prerequisite, SPAN 370, 371, or 373. A study of plays by principal Spanish dramatists of the 20th century. Polo de Bernabé

650 [150] THE SPANISH COMEDIA OF THE GOLDEN AGE (3). A comprehensive study of the Golden Age Spanish theater from its Renaissance beginnings through the 17th century. Collins, staff.

Courses for Graduates

601 [101X] SPANISH FOR READING I (3). For students with no background in Spanish or those needing a review of grammatical structures and vocabulary in preparation for SPAN 602. Not for graduate credit for students in the Department of Romance Languages. Fall. Staff.

602 [102X] SPANISH FOR READING II (3). Prerequisite, SPAN 601 or equivalent background in Spanish. Focus on Spanish for the reading knowledge exam for graduate degrees. SPAN 602 satisfies the requirement for most departments. Not for graduate credit for students in the Department of Romance Languages. Spring. Staff.

701 [201] BEGINNINGS OF CASTILIAN HEGEMONY TO 1369 (3). Early medieval romance period (11th century to 1369). The establishment of Castilian hegemony studied through a variety of texts (chronicles, miracles, collections of law and exempla, fueros, epic and lyric poems). Domínguez.

702 [202] THE TRASTAMARA DYNASTY: 1369 TO 1504/1516 (3). The final shaping of Castile, the beginning of nationhood, and American expansion studied through a variety of texts (chronicles, books of chivalry, lyric and narrative poems, sentimental novels and travel narratives). Domínguez.

707 [207] THE HISPANIC FILM: THEORY/CULTURE/LITERATURE (3). A study of Spanish and Spanish American film, with special attention to problems of an aesthetic and ideological nature and to the relationships between literature, culture and film. Polo de Bernabé.

709 [209] NONFICTION PROSE OF THE 16TH AND 17TH CENTURIES (3). An examination of the histories, chronicles and other documents written in Spain and Spanish American, with special emphasis on the literature of exploration. Perelmuter.

710 [210] 19TH-CENTURY SPANISH NOVEL (3). A study of the development of Romanticism, Costumbrismo, Realism and Naturalism, principally through the novels of Gil y Carrasco, Pereda, Valera, Pérez Galdós, Pardo Bazán, Clarín and Blasco Ibañez. Casado.

711 [211] 20TH-CENTURY SPANISH NOVEL TO 1936 (3). Major novelists associated with the Generation of 1898, Modernism, the Generation of 1914 and the Generation of 1927; principally Unamuno, Baroja, Valle-Inclán, Miró, Pérez de Ayala, Gómez de la Serna, Chacel and Sender. Casado.

712 [212] SPANISH CONTEMPORARY NOVEL (3). A study of major novelists from the Spanish Civil War of 1936 to the present time, with emphasis on Ayala, Cela, García Hortelano, Goytisolo, Benet and others. Casado.

714 [214] GOLDEN AGE POETRY (3). Selected poetic works from Garcilaso through Quevedo. Collins.

715 [215] SPANISH POETRY AND DRAMA OF THE 19TH AND EARLY 20TH CENTURY (3). Study of Spanish dramatists and poets of the period in the context of the 19th-century aesthetics and literary movements such as romanticism, post-romanticism, symbolism and modernism. Polo de Bernabé.

716 [216] CONTEMPORARY LYRIC POETRY (3). Major poets from the Generation of 1927 to the present. Polo de Bernabé.

721 [221] OLD SPANISH I (3). Provides a detailed and comprehensive survey of the Spanish language, tracking its development from its Indo-European ancestors to modern usage and examining its phonology, morpho-syntax, verbal dynamics, lexis and semantics. Binotti.

722 [222] OLD SPANISH II (3). Traces the development of the Spanish language from Latin to the present, focusing upon cultural, literary and historical factors that have contributed to its evolution. Binotti.

725 [225] GOLDEN AGE PROSE (3). The major prose works of the Golden Age, excluding those of Cervantes. Hsu, staff.

737 [237] TOPICS IN CONTEMPORARY LITERARY AND CULTURAL THEORY (CMPL 737) (3). Study of major topics in modern theory such as identities, time, space, history, nation, language, text and image, from modernity to postmodernity and beyond. Polo de Bernabé.

738 [238] SPANISH INTELLECTUAL HISTORY (3). The purpose of this course is to acquaint students with the basic ideology (philosophical, aesthetic, religious, political, economic) underlying Spanish peninsular literature from its origins to the end of the 17th century. Binotti.

750 [250] THE 18TH CENTURY IN SPAIN (3). Readings from 18th-century authors in various genres. Casado.

840 [340] SPECIAL READINGS (Var.). (Doctoral students only). Members of the graduate faculty.

993 [393] MASTER'S THESIS (3). Members of the graduate faculty.

994 [394] DOCTORAL DISSERTATION (3). Members of the graduate faculty.

Spanish American

Courses for Graduates and Advanced Undergraduates

613 [113] COLONIAL AND 19TH-CENTURY SPANISH AMERICAN LITERATURE (3). Prerequisites, SPAN 371 or 372, and 373. Advanced survey of literary works from 16th- through 19th-century Spanish America, with emphasis on their rhetorical foundations and historical, political and aesthetic connections. Perelmuter. González Espitia.

614 [114] MODERNIST AND CONTEMPORARY SPANISH AMERICAN LITERATURE (3). Prerequisites, SPAN 371 and 372 or 373. Advanced survey of Spanish American works from the 1880s through the present, with emphasis on their rhetorical foundations and historical, cultural, political and aesthetic connections. Perelmuter, Rivero. González Espitia.

620 [120] WOMEN IN HISPANIC LITERATURE (WMST 620) (3). Prerequisites, SPAN 371 or 372, and 373. The image of woman in 16th- and 17th-century Hispanic literature. A study of texts by Spanish and Spanish American authors. Readings in Spanish or in English translation. Lectures in English. Perelmuter.

Courses for Graduates

709 [209] NONFICTION PROSE OF THE 16TH AND 17TH CENTURIES (3). An examination of the histories, chronicles and other documents written in Spain and Spanish America, with special emphasis on the literature of exploration. Perelmuter.

741 [241] THE ESSAY AND SHORT STORY (CMPL 741) (3). Theory and practice of the essay and short story. Topics include masters of the Spanish American and international essay and short story, the evolutions of both genres, gender and cultural studies. Perelmuter, Rivero, González Espitia.

742 [242] POIESIS IN SPANISH AMERICA (3). Theories and practices of literary creation across genres and periods. González Espitia.

743 [243] TOPICS IN SPANISH AMERICAN PERFORMANCE STUDIES (3). A thorough grounding in contemporary plays in the Spanish-speaking Americas. Topics include performing class, ethnicity and gender; parody; staging nations; politics of metatheatre; postmodern agency; and the performance of everyday life. Staff.

744 [244] THE AESTHETICS OF THE BAROQUE IN SPANISH AMERICAN LITERATURE (3). The origin, development and persistence of a baroque aesthetic in Spanish American literature through an examination of diverse theories of baroque and close readings of representative texts. Perelmuter.

745 [245] THE VANGUARDS (CMPL 745) (3). The theory and practice of innovative writing, especially since the 19th century. Topics include the historical Spanish American and Anglo-European vanguards, experimental literature, modernismo's literary rebellion, gender and cultural studies. Rivero, González-Espitia.

746 [246] THE NOVEL IN SPANISH AMERICA (3). The novel to 1960. The course examines Romanticism, Realism, Naturalism, Modernism and the new national literatures through such authors as Avellaneda, Blest Gana, Silva, Asturias, Carpentier, Rulfo, Bombal and Vargas Llosa. González-Espitia.

747 [247] THE CONTEMPORARY NOVEL (CMPL 747) (3). The theory and practice of the novel since the 1960s. Topics include the Spanish American "Boom" of the 1960s and 1970s, major international trends and writers, gender and cultural studies. Rivero, González-Espitia.

835 [335] SEMINAR IN SPANISH AMERICAN LITERATURE (3). The focus of this seminar will vary, according to the instructor. Staff.

Curriculum in Russian and East European Studies

www.unc.edu/depts/slavic
ROBERT M. JENKINS, *Director*
Jacqueline Olich, *Associate Director*

Professors
Richard N. Andrews, Public Policy
Christopher Browning, History
Richard R. Cole, School of Journalism and Mass Communication
Carolyn Connor, Classics
Patrick Conway, Economics
Douglas Crawford-Brown, Environmental Sciences
Carl Ernst, Religious Studies
Jaroslav Folda, Art
H. Garland Hershey, School of Dentistry
Irva Hertz-Picciotto, School of Global Public Health
Michael Hunt, History
Konrad Jarausch, History
Robert Jenkins, Curriculum in Russian and East European Studies
Arnold Kaluzny, School of Global Public Health
Madeline G. Levine, Slavic Languages and Literatures
Bobbie Lubker, School of Education
David McNelis, Carolina Environmental Program
Louise McReynolds, History
Barbara Moran, School of Information and Library Science
Michael Peck, School of Medicine
John Pickles, Geography
David Pike, Germanic Languages
Barry Popkin, Carolina Population Center
Donald J. Raleigh, History
Steven S. Rosefielde, Economics
Peter Sherwood, Slavic Languages and Literatures
Robert L. Stevenson, School of Journalism and Mass Communication

Associate Professors
Lawrence E. Feinberg, Slavic Languages and Literatures
Charles Kurzman, Sociology
Timothy Mckeown, Political Science
Christopher Putney, Slavic Languages and Literatures
Michele Rivkin-Fish, Anthropology
Milada Vachudova, Political Science
Michael Votta, Music
Thomas Ricketts, School of Global Public Health
David Tate, School of Medicine
Ivana Vuletic, Slavic Languages and Literatures

Assistant Professors
Chad Bryant, History
Suzanne Gulledge, School of Education
Radislav Lapushin, Slavic Languages and Literatures
Zlatko Plese, Religious Studies
Graeme Robertson, Political Science
Mark Sorensen, Anthropology
Silvia Tomaskova, Anthropology
Jonathan Weiler, Russian and East European Studies
Irene Zipper, School of Social Work

Lecturers
Eleonora Magomedova, Slavic Languages and Literatures
Jacqueline Olich, Russian and East European Studies

Professors Emeriti
Joseph Anderle, History
Samuel H. Baron, History
Paul Debreczeny, Slavic Languages and Literatures
David M. Griffiths, History
Vasa D. Mihailovich, Slavic Languages and Literatures
Anthony R. Oberschall, Sociology
Robert Rupen, Political Science
James D. Stasheff, Mathematics
Chuck Stone, School of Journalism and Mass Communication

Requirements for the M.A. Degree

The Curriculum in Russian and East European Studies offers graduate work leading up to the degree of master of arts in Russian/East European studies. The degree program satisfies the general requirements of The Graduate School. In addition, the student must fulfill the following curriculum requirements:

- Four semester courses in a Slavic or East European language (Bulgarian, Czech, Hungarian, Macedonian, Polish, Russian or Serbo-Croatian)
- Completion of HIST 783, RUES 710 and RUES 730
- Completion of at least three courses in a given concentration. (Fields of concentration include art, biology, business, environmental sciences, classics, comparative literature, computer science, ecology, economics, environmental sciences, geologic sciences, history, journalism, law, linguistics, music, nonprofit leadership, peace, war and defense, philosophy, political science, psychology, public health, Slavic languages and literatures, social work, sociology and statistics)
- Completion and defense of the thesis project

Further information may be obtained from Robert Jenkins, Director,

The Center for Slavic, Eurasian and East European Studies, CB# 5125, FedEx Global Education Center, 301 Pittsboro St, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-5125. Telephone: (919) 962-0901. Fax: (919) 962-2494. E-mail: rjenkins@email.unc.edu. Web: www.unc.edu/depts/slavic.

Courses for Graduates and Advanced Undergraduates

469 [468] CONFLICT AND INTERVENTION IN THE FORMER YUGOSLAVIA (PWAD 469) (3). Focuses on ethnic and political conflicts in the former Yugoslavia and efforts by the international community to end conflict and promote peace and reconstruction.

694 [098] HONORS IN RUSSIAN AND EAST EUROPEAN STUDIES (3). Prerequisite, RUES 693H. Independent research and writing of an honors thesis for students majoring in Russian and East European studies.

699 [199] SELECTED TOPICS IN RUSSIAN AND EAST EUROPEAN STUDIES (3). Selected topics in Russian and East European studies. Varies by semester.

RUES 710 [210] CORE COLLOQUIUM (1). Series of follow-up discussions of guest lectures sponsored by the Center for Slavic, Eurasian, and East European Studies. The discussions will be based on bibliographies previously assigned by guest lecturers. Fall.

RUES 730 [230] IDENTITIES AND TRANSITIONS (3). Capstone course for the master of arts in Russian/East European studies. Interdisciplinary course focusing on the variety of problems encountered by the societies of East European countries and successor states of the former Soviet Union in their transition from communism to democracy. Spring. Jenkins, Robertson.

RUES 810 [310] GRADUATE SEMINAR IN RUSSIAN AND EAST EUROPEAN STUDIES (3). Advanced seminar. Topics vary. Fall and spring. Staff.

RUES 991 [299] INDEPENDENT STUDY IN RUSSIAN AND EAST EUROPEAN STUDIES (1–21). Allows students to undertake advanced research under the supervision of a faculty member. Fall, spring and summer. Staff.

RUES 993 [393] MASTER'S THESIS (3–6). Fall, spring and summer.

Department of Slavic Languages and Literatures

www.unc.edu/depts/slavdept
CHRISTOPHER R. PUTNEY, *Chair*

Professors
Madeline G. Levine (4) Russian and Polish Literatures
Peter Sherwood (15) Hungarian Language and Culture

Associate Professors
Lawrence Feinberg (3) Slavic Linguistics, Poetics
Christopher R. Putney (12) Russian Literature, Medieval Slavic Culture
Ivana Vuletic (13) Serbian and Croatian Language and Literature, Russian Literature

Assistant Professor
Radislav Lapushin (14) Russian Literature

Lecturer
Eleonora Magomedova, Russian Language

Professor Emeritus
Vasa D. Mihailovich

The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of master of arts and doctor of philosophy. The degree programs meet general requirements of The Graduate School plus certain departmental requirements.

Requirements for the M.A. Degree

For the degree of master of arts, a student may emphasize Russian literature and culture or comparative Slavic and East European literatures and cultures. All students are required to take the department's proseminar, SLAV 700 (one credit hour), register for three credits of SLAV 993 (master's thesis credits), take a comprehensive M.A. exam and write and defend a master's thesis. In addition, students must satisfy a language requirement (reading knowledge only) in one modern foreign language other than a Slavic language.

The master's candidate in Russian literature and culture is required to a) take one course in either medieval or 18th-century Russian literature and culture and b) take five courses to be distributed, with graduate advisor supervision, in 19th- and 20th-century Russian literature and culture. The student must also take Old Church Slavonic (SLAV 500), and pass or place out of Fourth-Year Russian Conversation and Reading (RUSS 412).

The master's candidate in comparative Slavic and East European literatures and cultures is required to a) take four courses in Russian literature and culture and b) take three comparative Russian and Slavic/East European literature and culture courses, or three exclusively non-Russian Slavic/East European literature and culture courses. The student must also take Old Church Slavonic (SLAV 500) and must complete two courses (one year) in a modern Slavic/East European language other than Russian.

Requirements for the Ph.D. Degree

An admitted candidate must have received an M.A. degree from this university or be able to show that his or her previous studies have provided a knowledge of the Slavic field comparable to that required for the M.A. degree at UNC–Chapel Hill. A student may concentrate in Russian literature and culture or comparative Slavic and East European literatures and cultures.

All students who have completed the master's degree at UNC–Chapel Hill or at another institution and who wish to advance to Ph.D. candidacy must take a qualifying comprehensive examination. The exam must be taken no later than the third semester of registration following completion of all master's degree requirements.

Detailed information about the written and oral Ph.D. comprehensive examinations is available from the department in a separate handout.

Teaching experience is an essential part of professional training. Therefore, teaching assistant instruction equivalent to at least three contact hours a week for one semester is required of all Ph.D. candidates.

Before advancing to candidacy, doctoral students are required to submit a written dissertation proposal and to defend it before their dissertation committee. In order to facilitate this process, students are required to earn the grade of "Satisfactory" in SLAV 960 (research and writing of the dissertation proposal).

Students must register for at least six credits of SLAV 994 (dissertation). The final step after writing the dissertation under the supervision of a faculty advisor is the oral defense of the dissertation, which will take place at least one week before the dissertation is to be submitted to The Graduate School and one month after it is submitted to the student's faculty committee.

Special Requirements for Degree Programs

The candidate in Russian literature must demonstrate a sound knowledge of Russian literature and culture and competence in one other Slavic literature and culture. Candidates for the doctorate in Russian literature and culture must have taken the seminar in Medieval and Baroque Russian Literature (RUSS 859) before they take their doctoral examinations. The candidate in a Slavic literature other than Russian must demonstrate a sound knowledge of that literature and competence in Russian literature.

Bulgarian (BULG)

401 [101] ELEMENTARY BULGARIAN (3). Pronunciation, structure of language and reading in modern Bulgarian.

402 [102] ELEMENTARY BULGARIAN (3). Prerequisite, BULG 401 or permission of the instructor. Pronunciation, structure of language and reading in modern Bulgarian.

403 [103] INTERMEDIATE BULGARIAN (3). Prerequisite, BULG 402 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Bulgarian.

404 [104] INTERMEDIATE BULGARIAN (3). Prerequisite, BULG 403 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Bulgarian.

405 [105] ADVANCED BULGARIAN (3). Prerequisite, BULG 404 or permission of the instructor. Advanced readings and discussion in Bulgarian in humanities and social science topics.

406 [106] ADVANCED BULGARIAN (3). Prerequisite, BULG 405 or permission of the instructor. Advanced readings and discussion in Bulgarian in humanities and social science topics.

411 [111] BULGARIAN LITERATURE (3). Introduction to Bulgarian literature in English translation. Some readings in Bulgarian for students who can read the language.

Czech (CZCH)

401 [101] ELEMENTARY CZECH (3). Pronunciation, structure of language and reading in modern Czech.

402 [102] ELEMENTARY CZECH (3). Prerequisite, CZCH 401 or permission of the instructor. Pronunciation, structure of language and reading in modern Czech.

403 [103] INTERMEDIATE CZECH (3). Prerequisite, CZCH 402 or permission of the instructor. Continuation of proficiency-based instruction begun in Elementary Czech.

404 [104] INTERMEDIATE CZECH (3). Prerequisite, CZCH 403 or permission of the instructor. Continuation of proficiency-based instruction begun in Elementary Czech.

405 [105] ADVANCED CZECH (3). Prerequisite, CZCH 404 or permission of the instructor. Advanced readings and discussion in Czech in humanities and social science topics.

406 [106] ADVANCED CZECH (3). Prerequisite, CZCH 405 or permission of the instructor. Advanced readings and discussion in Czech in humanities and social science topics.

411 [111] CZECH LITERATURE (3). Introduction to Czech literature in English translation. Some readings in Czech for students who can read the language.

Hungarian (HUNG)

401 [101] ELEMENTARY HUNGARIAN (3). Pronunciation, structure of language and reading in modern Hungarian. Sherwood.

402 [102] ELEMENTARY HUNGARIAN (3). Prerequisite, HUNG 401 or permission of the instructor. Pronunciation, structure of language and reading in modern Hungarian. Sherwood.

403 [103] INTERMEDIATE HUNGARIAN LANGUAGE (3). Prerequisite, HUNG 402 or permission of the instructor. Continuation of the proficiency-based instruction in Elementary Hungarian. Sherwood.

404 [104] INTERMEDIATE HUNGARIAN LANGUAGE (3). Prerequisite, HUNG 403 or permission of the instructor. Continuation of the proficiency-based instruction in Elementary Hungarian. Sherwood.

425 [125] TOPICS IN HUNGARIAN LITERATURE AND CULTURE (3). Study of topics in Hungarian literature and culture not currently covered in any other course. The specific topic will be announced in advance. Sherwood.

Macedonian (MACD)

401 [101] ELEMENTARY MACEDONIAN (3). Pronunciation, structure of language and reading in modern Macedonian.

402 [102] ELEMENTARY MACEDONIAN (3). Prerequisite, MACD 401 or permission of the instructor. Pronunciation, structure of language and reading in modern Macedonian.

403 [103] INTERMEDIATE MACEDONIAN (3). Prerequisite, MACD 402 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Macedonian.

404 [104] INTERMEDIATE MACEDONIAN (3). Prerequisite, MACD 403 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Macedonian.

405 [105] ADVANCED MACEDONIAN (3). Prerequisite, MACD 404 or permission of the instructor. Advanced reading and discussion in Macedonian in humanities and social science topics.

406 [106] ADVANCED MACEDONIAN (3). Prerequisite, MACD 405 or permission of the instructor. Advanced reading and discussion in Macedonian in humanities and social science topics.

Polish (PLSH)

401 [101] ELEMENTARY POLISH (3). Pronunciation, structure of language and reading in modern Polish.

402 [102] ELEMENTARY POLISH (3). Prerequisite, PLSH 401 or permission of the instructor. Pronunciation, structure of language and reading in modern Polish.

403 [103] INTERMEDIATE POLISH (3). Prerequisite, PLSH 402 or permission of the instructor. Continuation of the proficiency-based instruction in Elementary Polish.

404 [104] INTERMEDIATE POLISH (3). Prerequisite, PLSH 403 or permission of the instructor. Continuation of the proficiency-based instruction in Elementary Polish.

405 [105] ADVANCED POLISH (3). Prerequisite, PLSH 404 or permission of the instructor. Advanced readings and discussion in Polish on humanities and social science topics.

406 [106] ADVANCED POLISH (3). Prerequisite, PLSH 405 or permission of the instructor. Advanced readings and discussion in Polish on humanities and social science topics..

411 [111] 19TH-CENTURY POLISH LITERATURE AND CULTURE (3). A survey of the major works of 19th-century Polish literature and culture

in English translation. Some readings in Polish for students who can use the language. Levine.

412 [112] 20TH-CENTURY POLISH LITERATURE AND CULTURE (JWST 412) (3). A survey of the major works of 20th-century Polish literature and culture in English translation. Some readings in Polish for students who can use the language. Levine.

Russian (RUSS)

400 [100] THE EVOLUTION OF RUSSIAN (3). This course traces the development of Russian from late common Slavic to contemporary Russian. Consideration is given to linguistic developments as well as cultural, social and historical circumstances shaping contemporary Russian. Feinberg.

405 [101] THE STRUCTURE OF MODERN RUSSIAN (3). Prerequisite, RUSS 400 or equivalent. For students who want a systematic understanding of the language. Synchronic analysis of contemporary standard Russian phonology, morphology, morphophonemics, semantics and syntax. Feinberg.

406 [105] ADVANCED RUSSIAN GRAMMAR (3). Prerequisite, RUSS 204. A comprehensive review of Russian grammar on an advanced level, emphasizing reading and writing skills.

407 [106] ADVANCED RUSSIAN GRAMMAR (3). Prerequisite, RUSS 406. A comprehensive review of Russian grammar on an advanced level, emphasizing reading and writing skills.

411 [111] ADVANCED RUSSIAN CONVERSATION AND COMPOSITION (3). Prerequisite, RUSS 322, 407 or equivalent. Designed to develop conversational and writing skills in a variety of situations and subjects. Russian used, except for a minimum of explanations. Magomedova.

412 [112] ADVANCED RUSSIAN CONVERSATION AND COMPOSITION (3). Prerequisite, RUSS 411 or permission of the instructor. Designed to develop conversational and writing skills in a variety of situations and subjects. Russian used, except for a minimum of linguistic explanations or comments. Magomedova.

413 RUSSIAN STYLISTICS (3). Prerequisite, RUSS 412 or equivalent. Advanced Russian conversation and composition, with appropriate grammatical and stylistic explanations. Can be taken repeatedly for credit, but only counts once toward degree requirements. Magomedova.

414 RUSSIAN STYLISTICS (3). Prerequisite, RUSS 413 or equivalent. Continuation of Russian Stylistics at a more advanced level. Magomedova.

425 [125] TOPICS IN RUSSIAN LITERATURE (3). Material not currently covered in any other course. The specific topic will be announced in advance.

431 [131] DANDIES AND DEAD SOULS: RUSSIAN LITERATURE AND CULTURE, 1800–1850 (3). A survey of major works of Russian literature and culture in the first half of the 19th century. Readings in English translation. Some readings in Russian for qualified students. Putney, Levine,, Lapushin.

432 [132] GREAT NOVELS AND CURSED QUESTIONS: RUSSIAN LITERATURE AND CULTURE, 1850–1881 (3). A survey of major works of Russian literature and culture in the Golden Age, an era of sociopolitical reform. Readings in English translation. Some readings in Russian for qualified students. Putney, Levine, Vuletic, Lapushin.

435 [135] LITERATURE AND MUSIC IN RUSSIA (3). Exploring the uses Russian composers have made of literary works and motifs, as well as the response of Russian writers to musical compositions and composers, and to music as an art form. Feinberg.

441 [141] FROM DECADENCE TO REVOLUTION: RUSSIAN LITERATURE AND CULTURE, 1881–1945 (3). A survey of major works of fin-de-siècle Russian and early Soviet literature and culture. Readings in English translation. Some readings in Russian for qualified students. Levine, Vuletic, Lapushin.

442 [142] FROM COLD WAR TO CAPITALISM: RUSSIAN LITERATURE AND CULTURE, 1945–PRESENT (3). A survey of major works of Russian literature and culture from 1945 to the present. Readings in English translation. Some readings in Russian for qualified students. Lapushin.

462 [162] RUSSIAN POETRY OF THE 19TH CENTURY (3). Readings and lecture on 19th-century Russian poetry.

463 RUSSIAN DRAMA: FROM CLASSICISM TO MODERNISM (3). Survey of Russian drama as a literary and theatrical phenomenon from the end of the 18th to the beginning of the 20th centuries. Lapushin

464 [164] DOSTOEVSKY (3). Study of major works of Dostoevsky and a survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Levine, Putney.

465 [165] CHEKHOV (3). Study of major works of Chekhov and survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Putney, Lapushin.

471 [171] GOGOL (3). Study of major works of N. V. Gogol and a survey of contemporary authors and literary trends relevant to his creative career. Lectures and seminar discussions. Readings in Russian for majors, in English for nonmajors. Putney, Lapushin.

475 [175] LITERATURE OF RUSSIAN TERRORISM: ARSON, BOMBS, MAYHEM (PWAD 475) (3). Literary representations of Russian revolutionaries and terrorists in the 19th and early 20th centuries. Readings by Dostoevsky, Chernyshevsky, Bely, Joseph Conrad and by some of the terrorists themselves. Levine.

479 [179] TOLSTOY (3). Study of the major works of Tolstoy and a survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Levine, Vuletic, Putney.

486 [186] CONTEMPORARY RUSSIAN WOMEN'S WRITING (WMST 486) (3). A study of Russian women's writing after World War II, including both fictional and propagandistic works analyzed in their sociopolitical context. Serves as an introduction to Russian women's studies.

493 [193] RUSSIAN SHORT STORY (3). An introduction to the Russian short story. The readings, in English for nonmajors and in Russian for majors, include works from the 17th century to the present. Putney.

511 [211] RUSSIAN MASS MEDIA (3). Prerequisite, RUSS 412 or equivalent. Module 1. Fifth-year Russian, to expand and master the knowledge of the language necessary for understanding deep ongoing changes in different spheres of Russian society—political, social, economic, cultural, etc. Magomedova.

512 [212] RUSSIAN MASS MEDIA (3). Prerequisite, RUSS 511 or equivalent. Module 2. Fifth-year Russian, to expand and master the knowledge of the language necessary for understanding deep ongoing changes in different spheres of Russian society—political, social, economic, cultural, etc. Magomedova.

513 RUSSIAN CULTURE IN TRANSITION I (3). Prerequisite, RUSS 412. Fifth-year Russian—to expand knowledge of the language necessary for understanding social changes that are taking place in Russian society—in literature, art, culture and everyday human mentality. Magomedova.

514 RUSSIAN CULTURE IN TRANSITION II (3). Prerequisite, RUSS 412. Fifth-year Russian—continuing with the theme of RUSS 513 offered in fall semester. RUSS 513 is not a prerequisite. Magomedova.

560 [160] RUSSIAN SENTIMENTALISM AND ROMANTICISM (3). Prerequisite, RUSS 407. Survey of Russian sentimentalism and romanticism, with special attention to the intellectual currents of the period (ca. 1770 to 1850). Consideration of Western precursors (Rousseau, Sterne, Byron, et al.). Readings in Russian. Putney.

790 [190] TEACHING METHODS AND MATERIALS (1). For prospective teachers of Russian. Required of all teaching assistants. Magomedova.

851 [251] PUSHKIN (3). Study of major works of Pushkin. Lapushin.

859 [259] MEDIEVAL AND BAROQUE RUSSIAN LITERATURE (3). Literature from the advent of literacy to the late 17th century. Lectures on and interpretations of literature of Kievan Rus' down to Grand Muscovy. Readings in English for non-Slavic concentrators. Putney.

860 [260] RUSSIAN LITERATURE OF THE EIGHTEENTH CENTURY (3). A survey of major movements and genres from Prokopovich to Karamzin. Emphasis on Russian formulations of European models of neoclassicism, sentimentalism and pre-Romanticism. Putney.

866 [266] RUSSIAN SYMBOLISM (3). Prerequisite, reading knowledge of Russian or permission of the instructor. Introduction to the leading writers and works of the Symbolist movement in Russia. Vuletic.

867 [267] POST-SYMBOLIST POETRY (3). Prerequisite, reading knowledge of Russian or permission of the instructor. A study of the major poetic works of Gumilev, Akhmatova, Mandelstam, Mayakovsky, Khlebnikov, Pasternak, Tsvetaeva. Levine.

892 [292] RUSSIAN VERSIFICATION (3). A study of technical problems and thematic aspects in the development of Russian poetry. Feinberg.

950 [350] SEMINAR IN RUSSIAN LITERATURE (3). Prerequisite, permission of the instructor. Seminar on selected topics in Russian literature.

Serbian And Croatian (SECR)

401 ELEMENTARY SERBIAN AND CROATIAN LANGUAGE (3). Pronunciation, structure of the language and readings in modern Serbian and Croatian language. Vuletic.

402 [102] ELEMENTARY SERBIAN AND CROATIAN LANGUAGE (3). Prerequisite, SECR 401 or permission of the instructor. Pronunciation, structure of the language, and readings in modern Serbian and Croatian language. Vuletic.

403 [103] INTERMEDIATE SERBIAN AND CROATIAN LANGUAGE (3). Prerequisite, SECR 402 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Serbian and Croatian language. Vuletic.

404 [104] INTERMEDIATE SERBIAN AND CROATIAN LANGUAGE (3). Prerequisite, SECR 403 or permission of the instructor. Continuation of the proficiency-based instruction begun in Elementary Serbian and Croatian language. Vuletic.

405 [105] ADVANCED SERBIAN AND CROATIAN LANGUAGE (3). Prerequisite, SECR 404 or permission of the instructor. Advanced readings and discussion in Serbian and Croatian language on humanities and social science topics. Vuletic.

406 [106] ADVANCED SERBIAN AND CROATIAN LANGUAGE (3). Prerequisite, SECR 405 or permission of the instructor. Advanced readings and discussion in Serbian and Croatian language on humanities and social science topics. Vuletic.

411 [111] INTRODUCTION TO SERBIAN AND CROATIAN LITERATURE (3). Introduction to Serbian and Croatian literature with an emphasis on 19th- and 20th-century prose. Vuletic.

Slavic (SLAV)

405 [105] INTRODUCTION TO SLAVIC LINGUISTICS (3). The phonological and morphological history of Slavic languages from the late Indo-European to the split of the common Slavic linguistic unity. Feinberg.

409 [109] COGNITIVE LINGUISTICS (LING 409) (3). Development of and present state of research in cognitive linguistics. Readings discuss various language phenomena and are drawn from linguistics, psychology, philosophy, artificial intelligence and literary analysis of metaphor.

425H (125H) TOPICS IN SLAVIC LITERATURE (3).

463 [444] MEDIEVAL SLAVIC CULTURE (RELI 463) (3). Survey of medieval Slavic culture, beginning with Christianization in the ninth and 10th centuries. Themes include Byzantine missions, the replacement of paganism with Christianity, the oral traditions and Slavic literary relations. Readings in English for non-Slavic concentrators.

464 [164] IMAGINED JEWS: JEWISH THEMES IN POLISH AND RUSSIAN LITERATURE (JWST 464) (3). Explores the fictional representation of Jewish life in Russia and Poland by Russian, Polish and Jewish authors from the 19th century to the present. Levine.

465 [165] LITERATURE OF ATROCITY: THE GULAG AND THE HOLOCAUST IN RUSSIA AND EASTERN EUROPE (JWST 465, PWAD 465) (3). Literary representation in fiction, poetry, memoirs and other genres of the mass annihilation and terror in Eastern Europe and the former Soviet Union under the Nazi and Communist regimes. Levine.

467 [167] LANGUAGE AND POLITICAL IDENTITY (PWAD 467) (3). This course examines the roles of language policy and linguistic controversies in determining national identity and fueling political polarization. It focuses primarily on Western and Eastern Europe and Central Asia.

469 [169] COMING TO AMERICA: THE SLAVIC IMMIGRANT EXPERIENCE IN LITERATURE (JWST 469) (3). Fictional and autobiographical expressions of the Slavic and East European immigrant experience in the 20th century. Readings include Russian, Polish, Jewish and Czech authors from early 1900s to present.

470 [170] 20TH-CENTURY RUSSIAN AND POLISH THEATER (3). A comparative survey of the major trends in 20th-century Russian and Polish dramaturgy and theatrical production, with attention to aesthetic, professional and political connections between the two.

490 [125] TOPICS IN SLAVIC LITERATURE (3). Comparative study of topics in non-Russian Slavic literatures and culture not covered in any other course. Specific topics will vary and will be announced in advance.

500 [100] OLD CHURCH SLAVONIC (3). An introduction to the language of the oldest Slavic texts. Translation, grammatical analysis, comparison of texts. Feinberg,

560 [160] READING OTHER CULTURES: ISSUES IN LITERARY TRANSLATION (CMPL 560) (3). Prerequisite, reading knowledge of a language other than English. Starting from the proposition that cultural literacy would be impossible without reliance on translations, this course addresses fundamental issues in the practice, art and politics of literary translation. Levine.

580 [180] EAST EUROPEAN LITERARY CRITICISM (3). Survey of 20th-century Slavic literary criticism. Russian formalists, Bakhtin and his circle, Czech structuralists, Soviet semiotics. Emphasis on influence of Slavic criticism on development of Western literary criticism.Vuletic.

700 [200] PROSEMINAR IN SLAVIC LITERATURE (1). Prerequisite, graduate students only. A seminar that acquaints graduate students with the basic resources for conducting research in their field and trains them in various critical approaches to the analysis of Slavic literatures.

740 [240] READING COURSE (1–21). (On demand.)

751 [251] EAST SLAVIC LINGUISTICS (3). Prerequisites, SLAV 405 and four years of study of any East Slavic language. An examination of the linguistic history and contemporary dialectology of the East Slavic languages (Russian, Ukrainian, Belarusian) with emphasis on Russian. Feinberg.

752 [252] WEST SLAVIC LINGUISTICS (3). Prerequisites, SLAV 405 and/or SLAV 500 and one year of any West Slavic language. An examination of the linguistic history and contemporary dialectology of the West Slavic languages (Polish, Czech, Slovak, Upper and Lower Sorbian, Kashubian, Slovincian, Pomeranian).

753 [253] SOUTH SLAVIC LINGUISTICS (3). Prerequisites, SLAV 405 and one year of study of any South Slavic language. An examination of the linguistic history and contemporary dialectology of the living South Slavic languages (Slovenian, Serbo-Croatian, Macedonian, Bulgarian).

760 [260] TOPICS IN SLAVIC SOCIOLINGUISTICS (3). A seminar that acquaints graduate students with the variety of approaches to sociolinguistics research, with particular emphasis on the extant literature in Slavic sociolinguistics, language and identity, language and the nation.

905 [305] SEMINAR IN SLAVIC LINGUISTICS (3). Selected issues in Slavic synchronic and diachronic linguistics.

960 [360] PRE-DISSERTATION RESEARCH (3).

993 [393] MASTER'S THESIS (3–6).

994 [394] DOCTORAL DISSERTATION (3–9).

School of Social Work

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JACK M. RICHMAN, *Dean*

Distinguished Professors

Oscar A. Barbarin III (217) Children's Health and Mental Health, African American Children and Families, Family and Preschool Interventions, Black-White Achievement Gap

Gary L. Bowen (98) Social Work with Families, Middle and High School Success, Crime and Violence in Schools, Work and Family Linkages, Military Families, Community Capacity Building, Neighborhood Effects, Performance Driven Management

Mark W. Fraser (229) Children and Families at Risk, Substance Abuse and Other Forms of Antisocial Behaviors, Research Training and Scholarship

Matthew O. Howard (310) Adolescent Substance Abuse, Consequences of Inhalant and Ecstasy Abuse, Delinquency and Conduct Problems in Children and Adolescents, Evidence-Based Social Work and Chemical Dependency Practice

Kimberly J. Strom-Gottfried (033) Managed Care, Professional Ethics, Social Work Education, Bereavement

Charles L. Usher (227) Social Program Evaluation, Quantitative Research Methods, Human Services Management

Marie O. Weil (95) Community Practice, Social Administration, Services to Families and Children, Community Development, Social Work and the Law

Professors

Iris B. Carlton-LaNey (239) Social Welfare History (Especially African Americans and the Progressive Era), Rural Elderly African American Women and Social Support

Walter C. Farrell Jr. (351) Social Welfare and Health Policy, Hispanic Immigration Issues, Management and Community Practice, Nonprofit Leadership, Community and Economic Development and Employment, Discrimination and Inequality Issues

Gary M. Nelson (83) Organizational and Community Change, Social Gerontology, Self-Evaluation

Dennis K. Orthner (82) Human Services Design and Evaluation, Public Welfare and Family Policy, Family Strengths, Military Families

Jack M. Richman (88) Individual, Couples and Family Practice; Social Support; At-Risk Students; Evaluation

Kathleen A. Rounds (034) Public Health and Social Work, Maternal and Child Health, Program Evaluation

Sheryl I. Zimmerman (295) Evaluation of Practice, Social Gerontology, Psychosocial Aspects of Health, Long Term Care, Outcome Research, Methods for Studying Older Populations, Dementia, Hip Fracture

Clinical Professors

Nancy S. Dickinson (304) Social Welfare Policy, Continuing Social Work Education, Children and Family Services

Irene Nathan Zipper (27) Early Childhood Intervention, Family Support, Children's Mental Health Services, Service Coordination/Case Management, Service Integration

Associate Professors

Mimi V. Chapman (293) Social Work Practice, Child Abuse and Neglect, Children's Health and Mental Health, Immigration, Acculturation, Mental Health

Shenyang Guo (413) Research Methods, Quantitative Data Analysis, Child Welfare, Child Mental Health Services, Welfare Policies

Vanessa G. Hodges (241) Intervention Development and Evaluation, High-Risk Families and Children, Culturally Responsive Family Interventions, Social Support Assessment and Interventions

Amelia C. Roberts-Lewis (292) Women and Chemical Dependency, Cultural Diversity and Social Work Practice, Spirituality and Social Work Practice, Research in Perinatal Substance Abuse, Developing and Evaluating Gender Specific Substance Abuse Programs for Females

Gary L. Shaffer (102) School Social Work, Child Welfare, Interprofessional Teams and Intervention, International Social Work

Paul R. Smokowski (101) At-Risk Youth, Acculturation and Latino Families, Mixed-Methods Research Design, Developmental Science, Technology in Social Work Practice

Clinical Associate Professors

Kelly B. Reath (107) Rural Human Services, Policy Implementation, Distance Education

Mary Anne P. Salmon (219) Aging Issues (with Focus on Underserved Populations), Survey Development, Aging and Demographics, Family Caregiving

Anna M. Scheyett (222) Severe Mental Illnesses, Mental Health Consumers, Case Management, Mental Health Policy

Evelyn S. Williams (105) Child Abuse Prevention; Domestic Violence; Cultural Competence; Staff Development, Training and Supervision; Organizational Change

Research Associate Professors

Dean F. Duncan III (218) Program Evaluation, Management of Human Services Agencies, Research Methods, Community Collaboration, Achievement Gap

Judith B. Wildfire (279) Child Welfare, Child Abuse and Neglect Issues, Program Evaluation, Research, Performance Monitoring in Public Agencies

Assistant Professors

Sarah E. Bledsoe (446) Mental Health Services Research, Evidence Based Practice, Interpersonal Psychotherapy, Mood and Anxiety Disorders, Clinical Intervention Research, Knowledge Dissemination and Implementation in Agency Practice, Culturally Relevant Practices, Low-Income Populations

Natasha K. Bowen (103) Mental Health of Children and Adolescents, Prevention and Treatment of Behavior Problems, Evaluation of Practice, Developmental Psychopathology, Risk and Protection, School Social Work, Research Methods and Statistics

Michal Grinstein-Weiss (443) Assets Development Policies for Low-income Families, Saving Social and Economic Development, Program Evaluation, Poverty and Inequality

Rebecca J. Macy (325) Interpersonal and Relationship Violence, Coping with Personal Threats and Trauma, Prevention and Practice Interventions

Susan L. Parish (422) Support for Families of Children with Developmental Disabilities, Economic Implications of Caregiving, Long-Term Care for People with Developmental Disabilities, Health Outcomes for Children and Adults with Disabilities, Mothers with Developmental Disabilities

Clinical Assistant Professors

Deborah A. Barrett (425) Clinical Practice; Health, Illness and Disability; Reproductive Policy; Social Movements; Global Culture
Rebecca B. Brigham (091) Child Welfare and Public Policy, Foster Care and Adoption, Adult Learning Theory
Jean L. Byassee (291) Children's Mental Health, Parent/Provider Partnerships, Learning and Attention Disorders in Children and Adults
Joanne S. Caye (260) Child Welfare, Family-Centered Practice, Adolescence, Work with Foster Care and Adoptive Parents, Effects of Disasters on Families and Children
Lane G. Cooke (244) Family-Centered Services/Home-Based Services Delivery Systems in Communities and Neighborhoods, Family Preservation Programs, Child Abuse/Neglect, Family Violence, Rapid Assessment and Planning
Mathieu Despard (333) Community Economic and Asset Development for Lower-Income Communities, Community-Level Interventions and Problem Solving through Public-Private Partnerships, Social Entrepreneurship, Capacity Building with Small Nonprofits and Grassroots Organizations, Local and State Health Coverage Policies for the Uninsured and Community-Academy Partnerships
Melissa D. Grady (337) Mental Health, Clinical Practice, Sexual Violence/Trauma, Clinical Theory
Sherry M. Hrynewych (275) Substance Abuse, Women's Issues, Spirituality and Psychotherapy, Experiential Therapies, Self-Psychology, Autism Spectrum Disorders
Anne C. Jones (429) Women's Health Issues, International Social Work
Margaret L. Morse (398) Aging, Computer-Based Training, Web Site Design
Joelle Powers (448) School Social Work, Evidence Based Practice, School Success, Child/Adolescent Mental Health
Wanda F. Reives (012) Public Child Welfare, Family-Based Service, Public Human Services Management/Leadership
Tina M. Souders (431) Professional Ethics, Social Work and the Law, Child/Adolescent Mental Health, Nonprofit Law
Cynthia M. Wiford (420) Addiction, Distance Learning, Program Consultation

Research Assistant Professors

Steven H. Day (387) Program Evaluation, Delinquency Prevention, Community Planning and Development
Hye-Chung Kum (432) Program Evaluation, Management of Human Services Agencies, Research Methods, Community Collaboration, Social Welfare Policy and Program Analysis
Eleanor Brown (449) Program Evaluation, Child Maltreatment, Maternal and Child Health, Community and Organizational Development, Voluntarism
Laurie J. Selz-Campbell (419) Community-Based Services, Mental Illness and Identity, Early Intervention, Children's Mental Health, Activity-Based Therapies, Intervention Design and Evaluation

Clinical Instructors

Jo E. Adams (450)
Travis J. Albritton (451) Public Child Welfare, Substance Abuse Services, Spirituality and Social Work Practice, Family and Community Social Supports
Tanya M. Beckerdite (452) Older Adults, End of Life Issues, Long Term Care, Children with Special Needs, Deaf and Hard of Hearing, Social Work Licensure, Training, Strategic Planning
Mellicent O. Blythe (453) Child Abuse and Neglect, Child Welfare, Foster Care, and Clinical Practice
Lyndin W. Bolton (294) Substance Abuse Services, Mental Health
Carolyn S. Butler (433) Addiction, HIV/AIDS, Homelessness, Nonprofit Management
Denise' G. Dews (454) Aging, End-of-Life Care, Medical Social Work, Field Education, Child Welfare Workforce
Jodon A. Flick (298) Clinical Safety, Suicide, Mental Health, Child Welfare
Kerry A. Graves (455) Child Sexual Abuse, Adult Survivors of Sexual Abuse, Minorities and Sexual Abuse, Child Welfare and the Effects on Mental Health and Child Development Gangs
Melissa L. Godwin (456) Substance Abuse Prevention and Intervention, School-Based Mental Health Services, Gender Issues, Clinical Social Work
Rebecca L. Green (392) Families and Children, Child Welfare, Foster Care and Adoption, Data Analysis
Christine B. Howell (457) Group Process and Facilitation, Leadership Development for Supervisors/Managers in Public Social Services, Conflict Resolution, Rural Social Work Practice and Culture
Daniel C. Hudgins (038) Aging, Social Welfare Policy, Human Services Management, Community Collaboration
Johna L. Hughes (435) Mental Health, Substance Abuse, Children's Mental Health, Child and Adolescent Development, Parenting, Crisis Intervention
Kathy D. Johnson (437) Child Sexual Abuse, Forensic Interviewing, Child Pornography, Dynamics of Incestuous Families, Multidisciplinary Teams, Developing Protocols, Multivictim/Multiperpetrator Day Care Investigations, Effects of Child Maltreatment on Brain Development
Rodney D. Little (458) Group Process and Facilitation, Leadership Development for Supervisors/Managers in Public Social Services, Conflict Resolution, Rural Social Work Practice and Culture
Kathleen N. Lowe (438) Older Adults, End of Life Issues, Doctor-Patient Relationships, Long-Term Care
Ronald L. Mangum (439) Mental Health, Substance Abuse, Individual and Group Facilitation, Risk Focused Prevention
John D. McMahon (460) Family and Children's Services, Child Welfare, Improving Outcomes for Families
Tiffany Price (462) Families and Children, School Success, Community Collaboration
Deborah J. Vassar (463)
Jennifer S. Vaughn (464) Health and Mental Health Policy, Severe and Persistent Mental Illness, Homelessness
Julia Wacker (465)
Martha A. Weems (442) Clinical Practice, Substance Abuse, Mental Health, Crisis Intervention

Research Instructors

Crystal Stewart (466) Child Welfare, Program Evaluation, Racial Disparities in Child Welfare, Social Services Data Analysis, Human Services Management
Elizabeth C. Weigensberg (467) Child Welfare Policy, Evaluation of Child Welfare Agencies, Measurement of Child and Family Outcomes, Use of Data for Self-Assessment and Evaluation, Organizational Change

Lecturer

Barbara L. Leach (395) Mental Illness, Children's Issues, Family Advocacy

Professors Emeriti

S. Rachel Dedmon
Andrew W. Dobelstein
Dorothy N. Gamble
H. Carlisle Henley Jr.
Albert L. Johnson
Hortense K. McClinton
John B. Turner
The M.S.W. Program

Students complete the foundation curriculum of 32 credit hours of content in the areas of research, social work practice, social policy, human behavior and the social environment, institutionalized discrimination and field education.

In the advanced curriculum, students choose an area of concentration for an additional 30 credit hours. There are three concentrations in the advanced curriculum. The Direct Practice Concentration prepares students for advanced practice with individuals, families and groups. The Management and Community Practice Concentration prepares students for advanced work in social work administration, management

and community practice. The Self-Directed Concentration allows students to craft a blended concentration, combining direct and management and community practice courses to gain the skills needed for their particular professional goals.

Students develop individualized plans of study in consultation with their advisors, and their course selection must be guided by the distributional requirements of the concentration they have selected and by their specific professional and educational goals. However, students can combine interests in direct services and macro practice, and use elective credits to pursue learning and career goals related to more than one area of interest.

Admission is based on an evaluation of the applicant's transcripts, references, written statement of interests in the field, Graduate Record Examination (GRE) scores, prior experience and readiness to undertake graduate professional education. The applicant must have received a bachelor's degree from a college or university, preferably with a broad liberal arts preparation in social and biological sciences and the humanities.

Distance education programs are located in Asheville, Durham and Winston-Salem. The first year of graduate professional education in these programs is taken on a part-time basis over two successive academic years. In the first year students take two courses each semester, and in the second year students take two courses, participate in a field seminar and complete 16 hours per week in a field placement each semester. Admission to these programs is granted on the same basis as admission to the full-time program. Upon completion of the first-year requirements, distance education students complete the degree as full-time students on the Chapel Hill campus.

The normal time period for degree completion is four semesters of full-time study. However, graduates of undergraduate social work programs that are accredited by the Council on Social Work Education and who meet specific course and admissions requirements are eligible to apply for either full-time or distance education advanced standing programs. In the full-time advanced standing program at Chapel Hill, students fulfill the degree requirements in 12 months through two summer sessions and two semesters. A distance education advanced standing program is located in Winston-Salem, North Carolina, and allows students to complete degree requirements in 20 months through two summer sessions and three semesters.

The Ph.D. Program in Social Work

The Ph.D. program in social work is designed to meet the growing demand for social work and social welfare research scholars in academic and research settings. Graduates are prepared to conduct a variety of theory construction and research activities that include building, testing and refining explanatory theory for understanding personal and social problems, and practice theory for understanding change processes; designing social interventions that test explanatory and/or practice theory; and assessing the effects of planned social interventions through models of process, outcome and impact evaluation.

The curriculum is grounded in core social work and social welfare courses and thorough training in research methodology and data analysis. At the same time, students design their program of study to focus on a social problem and intervention in their area(s) of interest.

In the admissions process, students are asked to provide evidence of

- A master's degree in social work from a school accredited by the Council on Social Work Education (applicants without an M.S.W. may apply to the M.S.W./Ph.D. Continuum Program)
- Academic ability, as demonstrated in academic achievement and Graduate Record Examination (GRE) scores
- Writing ability, as demonstrated in a writing sample
- Commitment to the values, goals and purposes of the social work profession
- Professional experience in human services and

A direction for and commitment to scholarly work congruent with the objectives and resources of the doctoral program

Courses for Graduates and Advanced Undergraduates

400 [106] RACISM: IMPLICATIONS FOR HUMAN SERVICES (AFAM 400) (3). This course's organizing focus will be how to work with minority groups, especially African Americans. The conceptual framework will be directed toward relationship building to enhance service delivery.

401 [129] MANAGING THE EFFECTS OF DISASTERS ON FAMILIES AND CHILDREN (3). Designed to examine the effects that disasters have on children, their families and on communities, this course gives students an understanding of how to deal with survivors' reactions to trauma and how to decrease the chances of long-term damage when disaster strikes.

402 [198] FOUNDATIONS OF FAMILY BEHAVIOR (3). Review of family research and interventions that serve as a foundation for promoting constructive family development and interactions.

409 SPECIAL TOPICS IN PREPROFESSIONAL HUMAN BEHAVIOR AND THE SOCIAL ENVIRONMENT (1–6).

469 SPECIAL TOPICS IN PREPROFESSIONAL DIRECT PRACTICE (1–6).

490 [150] PUBLIC SERVICE AND SOCIAL CHANGE (4). Course examines role of volunteer involvement and citizen participation in community development, grassroots organizing, advocacy and other efforts to create a more just and democratic society. Includes a service learning requirement.

491 [151] COMMUNITY ORGANIZING FOR SOCIAL CHANGE (4). Course examines different types of advocacy strategies and their use in efforts both to enhance the delivery of services to disadvantaged populations and to promote social change in communities.

499 SPECIAL TOPICS IN PREPROFESSIONAL MACRO PRACTICE (1–6).

Courses for Graduates

500 [103] HUMAN DEVELOPMENT IN CONTEXT I: INFANCY TO ADOLESCENCE (3). This course provides an overview of child and adolescent development in context, surveying major theoretical frameworks and highlighting the impact of different factors on individual development, functioning and health.

501 [203] CONFRONTING OPPRESSION AND INSTITUTIONAL DISCRIMINATION (3). This course examines institutionalized oppression and its implications for social work practice at all levels, emphasizing the consequences of social inequality and the social worker's responsibilities to fight oppression.

505 HUMAN DEVELOPMENT II: ADULTHOOD TO OLDER ADULTHOOD (3). This course reviews typical and divergent adult development in context, surveys major theoretical frameworks, and highlights the impact of social injustices on adult development.

510 [102] FOUNDATIONS FOR EVIDENCE-BASED PRACTICE AND PROGRAM EVALUATION (3). Develop knowledge of evidence-based practice, including skills needed to acquire and assess appropriate interventions for practice and skills required to evaluate social work practice.

520 [220] SOCIAL WORK PRACTICUM I (3). Students learn beginning practice skills through experimental opportunities and apply core knowledge to direct (individuals, families, groups) and macro (organizations, communities) social work practice two days per week in an agency setting. (Field fee: $300.)

521 [221] SOCIAL WORK PRACTICUM II (3). A continuation of SOWO 520, providing opportunities for students to demonstrate increased ability to assess, plan, administer, and evaluate appropriate social work practice interventions. (Field fee: $300.)

522 [219] PRE-CONCENTRATION PRACTICUM FOR ADVANCED STANDING STUDENTS (4). Course designed to assist students in summer classroom learning with direct experience in specialized field of practices. Serves to bridge the BASW practicum with advanced concentration practicum. (Field fee: $300.)

523 [217] FOUNDATION FIELD SEMINAR I (1). Course is designed to assist students in integrating and applying classroom learning with the direct experience of the foundation field practicum. Opportunities are provided for discussion, support and skills practice.

524 [218] FOUNDATION FIELD SEMINAR II (1). Course is designed to assist students in integrating and applying classroom learning with the direct experience of the foundation field practicum. Opportunities are provided for discussion, support and skills practice.

530 [101] FOUNDATIONS OF SOCIAL WELFARE AND SOCIAL WORK (3). Introduces public welfare policy through lecture and discussion of the purposes public welfare serves; describes the most important programs created by those policies.

540 [227] SOCIAL WORK PRACTICE WITH INDIVIDUALS, FAMILIES AND GROUPS. (3). Provides the foundation for social work practice with individuals families, and groups. It emphasizes basic knowledge, analytic and practice skills, and values necessary for practice.

570 [224] SOCIAL WORK PRACTICE WITH ORGANIZATIONS AND COMMUNITIES (3). Participants explore frameworks, values, and skills to meet individual and family needs through interventions with work groups, organizations, and communities.

604I [604] AGING AND HEALTH (DENT 604I, PHCY 604I, EPID 620I, HMSC 904I, MEDI 604I, NURS 782I, PHYT 904I, PSYC 904I, SOCI 824) (3). Introduction to normal aging, diseases of aging, mental health issues and the use of health services by older adults.

607I [266] AGING AND PUBLIC POLICY (DENT 607I, PHCY 607I, FMME 607I, HMSC 951I, HPAA 961I, MEDI 607I, NURS 783I, PSYC 907I) (3). Prerequisite, SOWO 530. Students learn of social service, health and income policy with the aged. Issues pertaining to informal support systems and disadvantaged groups are explored in the context of aging policy.

610I INTRODUCTORY SPANISH FOR HEALTH PROFESSIONALS (MEDI 610, NURS 610, DENT 610, PHCY 610, PUBH 610, AHSC 610) (3). Primarily e-learning course provides social work students with opportunity to develop their oral communication skills at the introductory level via DVD, Web and textbook/workbook. Instructor-led.

613I [613] INTERMEDIATE SPANISH FOR HEALTH CARE I (MEDI 613, NURS 613I, DENT 613, PHCY 613I, PUBH 613I, AHSC 613) (3). An intermediate-level Spanish course designed to help students and practicing health professionals develop oral proficiency skills as well as cultural awareness.

614I [614] INTERMEDIATE SPANISH FOR HEALTH CARE II (MEDI 614, NURS 614I, DENT 614, PHCY 614I, PUBH 614I, AHSC 614I). A continuation of SOWO 613, an intermediate-level Spanish course designed to help students and practicing health professionals develop oral proficiency skills as well as cultural awareness.

615I ADVANCED SPANISH FOR HEALTH CARE (MEDI 615I, NURS 615I, DENT 615I, PHCY 615I, PUBH 615I, AHSC 615I) (3). An advanced-level Spanish course designed to help students and practicing health professionals develop oral proficiency skills as well as cultural awareness.

700 [252] ALCOHOL, TOBACCO, AND OTHER DRUGS (ATOD): ABUSE AND DEPENDENCE (3). Surveys the field of substance use, abuse, and dependency, providing an overview of macro and micro issues and the use of the Bio-Psycho-Social-Spiritual model of addictions.

701 [278] ALCOHOL, TOBACCO, AND OTHER DRUGS (ATOD): BIOMEDICAL BASIS (3). Prerequisite or corequisite, SOWO 700. This course covers the biomedical basis of substance related disorders. Students will develop a broad scientific perspective on different classes of substances of abuse and the biological basis of substance dependence.

702 [276] AFRICAN AMERICAN WOMEN'S HEALTH ISSUES (WMST 702) (3). Explores selected health issues confronting African American women and identifies race, gender, age and class variables that impact health.

703 [284] ETHICAL DECISION MAKING IN SOCIAL WORK PRACTICE (3). A study of ethical decision making, along with potential guidelines for resolving dilemmas, and an in-depth examination of current illustrative practice issues.

709 [381] SPECIAL TOPICS IN HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT (1–6).

709.1 LESBIAN, GAY, BISEXUAL, TRANSGENDER, INTERSEX AND QUEER (LGBTIQ) HEALTH DISPARITIES AND WELLBEING (3). Introduces students to lesbian, gay, bisexual, transgender, intersex and queer health issues and disparities by discussing key health and mental health issues across the lifespan.

715 ADVANCED STANDING BRIDGE COURSE (6). Course facilitates students' transition from baccalaureate programs to Advanced Standing MSW Program. Course will review and integrate selective core baccalaureate content in practice, human behavior, diversity, social policy and research.

719 [384] SPECIAL TOPICS IN RESEARCH (1–6).

720 [320] INDIVIDUALIZED FIELD PRACTICUM (1–6). (Field fee: $300.)

730 [281] SOCIAL WORK AND THE LAW (3). Course provides familiarity with legal processes, legal research and legal analysis within the context of socio-legal issues important to social work practice.

731 [701] SOCIAL WELFARE POLICY ANALYSIS (PLCY 731) (3). Review of developments in U.S. welfare policy and economics, and social and political forces undergirding reform initiatives since the 1960s. Analysis of data on impacts of welfare policies and programs.

739 [383] SPECIAL TOPICS IN POLICY (1–6).

760 [277] ALCOHOL, TOBACCO AND OTHER DRUGS (ATOD): CLINICAL PRACTICE (3). Prerequisites or corequisites, SOWO 700 and SOWO 540, equivalent courses or permission of the instructor. Students develop knowledge, skills and attitudes specific to substance use, abuse and dependency in order to work effectively in a variety of clinical settings with clients experiencing substance-related problems.

761 [279] ALCOHOL, TOBACCO AND OTHER DRUGS (ATOD): SOCIAL WORK PRACTICE WITH CULTURALLY DIVERSE POPULATIONS (3). Prerequisites or corequisites, SOWO 700 and SOWO 540, equivalent courses or permission of the instructor. Provides an overview of the unique problems and needs of diverse populations who misuse ATOD, and focuses on the application of culturally sensitive intervention strategies.

762 [380] RURAL HEALTH: AN INTERDISCIPLINARY APPROACH (3). This multidisciplinary course in health, pharmacy, dentistry and social work provides a knowledge base and a forum for discussing issues in rural health. Provides training in problem solving by means of an interdisciplinary team approach.

763 [385] INTERDISCIPLINARY TEAMWORK IN GERIATRICS (MEDI 763, AHSC 763) (3). This course emphasizes the acquisition of skills and competencies necessary for effective interdisciplinary geriatrics care and leadership. With emphasis on a variety of settings in rural and/or underserved communities, the course includes case- and problem-based learning, presentations on aspects of teamwork, observations of practicing teams and interviews with team members.

769 [382] SPECIAL TOPICS IN DIRECT PRACTICE (1–6).

769.1 [370.5] MANAGING SENSITIVE AND DANGEROUS SITUATIONS IN PRACTICE (1.5). Students will apply cognitive-behavioral, strategic, structural and motivational models in challenging practice situations common to public and nonprofit agency social work. Extensive observed skill practice is followed by analysis, feedback and reflection.

769.2 [370.6] USE OF SELF (1.5). This course allows students to consider and explore questions of boundary violations, types of self-disclosure and the impact these choices have on helping relationships.

769.3 [370.7] PSYCHODRAMATIC METHODS IN CLINICAL PRACTICE (1.5). This course will provide students with a foundation for using experiential techniques. Students will learn basic strategies for facilitating psychodrama groups, experiential family therapy and skills training sessions.

799 [370] SPECIAL TOPICS IN MACRO PRACTICE (1–6).

799.1 [340.1] HUMAN RESOURCE MANAGEMENT (1.5). Students will learn requisite knowledge to select and exercise skills in human resource management, including employee recruitment and hiring, performance appraisals, motivation, staff development and creating a responsive work environment.

799.2 [340.2] SUPERVISION AND CONSULTATION (1.5). This course focuses on supervisory, administrative, supportive and educational functions in a range of social work settings. Knowledge and skills for a new supervisor are emphasized.

799.3 [340.3] LEADERSHIP IN CHILD WELFARE (1.5). This course focuses on skills in consultation, program development and collaboration to strengthen child welfare programs and render them more responsive to the needs of children and families. Systems reform, cutting edge programs and leadership roles will be emphasized.

800 [230] ADULT HEALTH AND MENTAL HEALTH (3). Prerequisite, SOWO 500. This course examines adult health and mental health conditions and focuses on the impact these have on individual and family development and functioning.

801 [234] CHILD AND ADOLESCENT HEALTH AND MENTAL HEALTH (3). Prerequisite, SOWO 500. Reviews theories and research that serve as a foundation for assessing and serving children with serious health problems, physical disabilities and mental disorders.

802 [233] FAMILY STRESS: COPING AND SOCIAL SUPPORT (3). Prerequisite, SOWO 500. A review of theories and research on family stress, coping and social support; an examination of family resources and adaptation associated with life cycle transitions, environmental situations and catastrophic events.

803 [236] HUMAN BEHAVIOR OF AGING (3). Prerequisite, SOWO 500. A presentation of major biological, psychological and sociological theories used to understand the normal aging process. The course surveys pathologies and functional disorders associated with aging. Special emphasis given to disadvantaged populations.

804 [239] ORGANIZATIONAL AND COMMUNITY BEHAVIOR (3). Prerequisites, SOWO 500 and SOWO 570. Explores theories and models for understanding the political, economic and institutional environment for community planning and the development and management of human services policies and programs.

810 [292] EVALUATION OF SOCIAL INTERVENTIONS (3). Prerequisite, SOWO 510. Students develop knowledge of the purposes of evaluation research and the approaches and methodologies necessary to evaluate social work interventions.

820 [222] SOCIAL WORK PRACTICUM III (6). Students apply specialized knowledge to social work practice at an advanced level with individuals, families, small groups, organizations and/or communities in an agency of a specialized field. (Field fee: $300.)

821 [223] SOCIAL WORK PRACTICUM IV (6). A continuation of SOWO 820, providing opportunities for the students to demonstrate increased ability to assess, plan, administer and evaluate appropriate social work interventions in a specialized field of practice (Field fee: $300.)

830 [267] HEALTH AND MENTAL HEALTH POLICY (3). Prerequisite, SOWO 530. Examines national and state health/mental health policy, focusing on historical, legal, sociopolitical and economic factors influencing financing, access and service delivery. Explores skills and strategies for policy analysis and change.

831 [262] CHILDREN'S SERVICES POLICIES AND PROGRAMS (3). Prerequisite, SOWO 530. This course addresses federal, state, and local children's policies and programs. Students learn to analyze child welfare, mental health and allied policies, regulations and programs influencing children's services.

832 [264] FAMILY POLICY (3). Prerequisite, SOWO 530. Examines policies affecting families in order to develop a broad understanding of various policy alternatives, their consequences, and the role of social workers as policy advocates.

834 [269] POLICY PRACTICE (3). Prerequisite, SOWO 530. This course focuses on analysis and skills development in administrative/legislative policy, lobbying and advocacy at multiple levels. Policy practice roles in a range of student interest areas will be emphasized.

840 [247] HEALTH AND MENTAL HEALTH PRACTICE WITH ADULTS (3). Prerequisite or corequisite, SOWO 800. Seminar on clinical health and mental health social work practice with adults. Covers assessment and a wide range of theoretically based interventions. Course includes lectures and experiential exercises.

841 [248] HEALTH AND MENTAL HEALTH PRACTICE WITH CHILDREN AND ADOLESCENTS (3). Prerequisite or corequisite, SOWO 801. This course prepares students for health and mental health practice with children and adolescents and their families. Prevention, assessment and social intervention will be addressed.

842 [242] FAMILY-CENTERED SOCIAL WORK PRACTICE (3). Prerequisite or corequisite, SOWO 802. Seminar introduces students to family-centered social work practice. Course provides a theoretical base for developing direct practice skills in the treatment of the family as a unit.

843 [246] DIRECT PRACTICE WITH AGING POPULATIONS (3). Prerequisite or corequisite, SOWO 803. This course addresses social work practice with elderly in areas of individual and family treatment—group work, case management, supervision, consultation and training, and beginning skills in program planning and administration.

850 [199] SCHOOL SOCIAL WORK POLICY/PRACTICE (3). Prerequisite, SOWO 540, equivalent course, or permission of the instructor. An examination of public school social work policy and practice. The course emphasizes an ecological approach within the context of the school-family-community environment.

851 [228] SOCIAL WORK PRACTICE WITH GROUPS (3). Prerequisite or corequisite, SOWO 540, equivalent course, or permission of the instructor. Enables students to become more knowledgeable and skillful as social group workers. Phases of group development and worker tasks in each phase provide the course framework.

852 [243] SOCIAL WORK PRACTICE WITH COUPLES (3). Prerequisite, SOWO 540, equivalent course, or permission of the instructor. A clinical seminar that analyzes the operations and character of couples counseling as a human services technique.

853 [244] APPROACHES TO BRIEF TREATMENT (3). Prerequisite, SOWO 540 or permission of the instructor. Clinical seminar introduces students to various types of brief treatment, including crisis intervention, psychodynamic, cognitive, behavioral and solution-focused therapies.

854 [255] ANTISOCIAL BEHAVIOR IN CHILDHOOD AND EARLY ADOLESCENCE: THEORY AND PRACTICE (3). Prerequisite, SOWO 540, equivalent course, or permission of the instructor. This course explores theories and interventive methods related to practice with children who have antisocial, aggressive behavior. Emphasis is placed on using protective/risk factors to design multisystemic service strategies.

855 [282] TREATMENT OF TRAUMA AND VIOLENCE (3). Prerequisite, SOWO 540, equivalent course or permission of the instructor. This course provides an in-depth analysis of the etiology, effects and dynamics of family violence, as well as the identification of appropriate assessment and treatment strategies.

856 [283] CARE OF THE DYING AND BEREAVED (3). Prerequisite, SOWO 540, equivalent course, or permission of the instructor. This interdisciplinary clinical course addresses issues and practice models relating to terminal illness and bereavement faced throughout the life span. Cotaught by social work and nursing faculty.

857 [245] CLINICAL PRACTICE WITH FAMILIES (3). Prerequisite, SOWO 540, equivalent course, or permission of the instructor. This practice course is devoted to intervention with families. Intervention methods will be applied to families coping with major life stressors and relational problems. Family therapy models are covered.

860 [257] CHILD WELFARE PERSPECTIVES AND PRACTICES (3). Focus on the knowledge, skills and critical thinking necessary for effective practice in child welfare. Students examine their own perspectives regarding pertinent research, current events and initiatives in the state.

862 [272] SERVICES FOR PERSONS IN GRIEF (3). Course will help students to understand the dynamics of the grieving process and the impact of bereavement on individuals/families, examine various determinants of loss and issues of complicated grief and identify strengths-based clinical interventions.

874 [249] MANAGEMENT AND COMMUNITY PRACTICE (3). Prerequisite or corequisite, SOWO 804. Examines social work leadership in management and community practice within complex political and economic environments, emphasizing social work values and intervention methods.

880 [238] SUSTAINABLE DEVELOPMENT (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. Examines perspectives and models of sustainable development. Students will analyze a project and present a participatory plan for engaging in sustainable development work.

881 [250] COMMUNITY PRACTICE AND PLANNING (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. Course focuses on roles and skills in community development, planning and organizing, and on analysis of community practice models. Students will provide peer training in their special interest areas.

882 [251] CITIZEN PARTICIPATION AND VOLUNTEER INVOLVEMENT (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. Examines the role of grassroots organization in advocacy, self-help and social development, the involvement of citizens in public planning and the development of volunteer programs.

883 [254] MARKETING AND FUNDRAISING FOR NONPROFIT ORGANIZATIONS (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. This course helps students to develop skills and practices associated with marketing and fundraising strategies for nonprofit organizations at the macro level.

884 [256] EXECUTIVE LEADERSHIP IN NONPROFIT ORGANIZATIONS (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. An in-depth analysis of the executive role in nonprofit organizations, particularly in leadership transitions, strategic planning, board development, policy administration, governance, employee relations and resource planning and acquisition.

885 [702] FINANCIAL MANAGEMENT OF NONPROFIT ORGANIZATIONS (PUBA 702) (3). Prerequisite, SOWO 570, equivalent course or permission of the instructor. Provides basic financial skills for leaders of nonprofits, including bookkeeping fundamentals, interpreting financial statements, budgeting, cash management and investment, and legal compliance.

Ph.D. Courses

719.1 [384] STRUCTURAL EQUATION MODELING (3). In this course, students will learn fundamental concepts and skills to conduct structural equation modeling and will learn how to apply these techniques to social work research.

900 [301] FOUNDATIONS FOR THEORY CONSTRUCTION (3). A critical and historical understanding of social work knowledge, values and intervention provides students with a foundation for theory construction.

910 [303] RESEARCH METHODS IN SOCIAL INTERVENTION (3). Prerequisites, SOWO 510 and SOWO 304 or equivalent. An introduction to the basic principles of research for planning and evaluating social interventions. Topics include problem formulation, design, measurement, analysis and the application of findings to theory and practice.

911 [304] INTRODUCTION TO SOCIAL STATISTICS AND DATA ANALYSIS (3). Prerequisite, SOWO 510 or equivalent. Designed to explore basic principles and to provide advanced instruction in data analysis, including the construction and analysis of tables, statistical tests and an introduction to the use of computer programs.

912 [305] RESEARCH PRACTICUM I (3). Prerequisite, SOWO 911. Students develop independent research competence through work on a research project under the direction of an experienced researcher.

913 [313] ADVANCED RESEARCH METHODS IN SOCIAL INTERVENTION (3). Prerequisites, SOWO 900, 940. Students build advanced competence in research design, data collection, data analysis and statistics by analyzing exemplary social work research and presenting independent learning projects within specialized areas of study.

914 [314] MEASUREMENT IN SOCIAL INTERVENTION RESEARCH (3). Prerequisites, SOWO 910, 911. Course deals with quantitative and qualitative measurement strategies. Readings focus on theoretical and conceptual foundations of qualitative and quantitative measurement. Students develop skill through two field studies.

915 [315] RESEARCH PRACTICUM II (Var.). Continuation of Research Practicum I. (On request.)

919 [399] SPECIAL TOPICS IN DOCTORAL RESEARCH.

919.001 [399] LONGITUDINAL AND MULTILEVEL ANALYSIS (3). This course introduces students to statistical frameworks, analytical tools and social behavioral applications of three types of models: event history analysis, hierarchical linear modeling (HLM) and growth curve analysis.

940 [312] DEVELOPMENT OF SOCIAL INTERVENTION MODELS (3). Prerequisite, SOWO 900. A systematic approach to the design, implementation and evaluation of social interventions provides the framework for developing models that address a range of social issues and needs.

941 [319] TEACHING PRACTICUM (3). This practicum provides a range of supervised classroom or training opportunities designed to prepare advanced doctoral students for faculty positions in undergraduate- and graduate-level social work education.

994 [394] DOCTORAL DISSERTATION (Var.). Dissertation work. (On request.)

Department of Sociology

sociology.unc.edu
HOWARD E. ALDRICH, *Chair*

Professors

Howard E. Aldrich (42) Formal Organizations, Race and Ethnic Relations, Inequality, Evolutionary Theory, Social Networks
Judith Blau (5) Education, Justice Studies, Sociology of Art
Kenneth A. Bollen (47) Comparative Political Structures, Statistics, International Development
Barbara Entwisle (48) Social Demography, Methods, Community, Environment
Larry Griffin (69) Cultural Sociology, Race Ethnic/Minority Relations, Quantitative Methodology
Guang Guo (51) Biosocial Interactions, Social Statistics, Demography
Kathleen M. Harris (6) Social Demography, Family and Child Well-Being, Poverty, Public Policy
Arne L. Kalleberg (49) Work, Organizations, Occupations, Social Stratification, Economic Sociology
Sherryl Kleinman (38) Social Psychology; Qualitative Research; Sociology of Emotions; Race, Class and Gender
Charles Kurzman (57) Political Sociology, Social Movements, International Development, Comparative and Historical, Social Theory, Islamic Studies
Victor W. Marshall (60) Aging, Life Course, Health, Work
François Nielsen (43) Comparative and Historical, Methods, Sociobiology
Ronald R. Rindfuss (34) Demography, Family, Environment
Peter Uhlenberg (20) Demography, Family, Aging

Research Professor

Glen H. Elder, Jr. (46) Life Course, Social Change, Family, Human Development

Associate Professors

Kenneth T. Andrews (68) Social Movements, Political Sociology, Organizations, Race and Ethnic Relations, Environment
Philip N. Cohen, (71) Gender, Stratification, Work and Family, Work and Occupations
Jacqueline Hagan, (72) Migration, Religion, Race and Ethnicity
Ted Mouw (58) Social Stratification, Demography, Economic Sociology
Lisa D. Pearce (65) Family, Demography, Religion
Andrew J. Perrin (64) Political Sociology, Sociology of Culture, Sociology of Work, Social Theory, Social Movements
Michael J. Shanahan (65) Social Psychology, Life Course Studies, Sociology of Childhood and Adolescence, Transition to Adulthood
Karolyn Tyson (62) Sociology of Education, Qualitative Methods, Social Inequality, Social Psychology

Assistant Professors

Neal Caren, (73) Social Movements/Collective Action
Margarita Mooney, (74) Religion and Migration, Residential Mobility and Population Distribution

Joint Appointment

John D. Kasarda (32) Human Ecology, Urban Sociology, Public Policy

Adjunct Faculty

M. Richard Cramer, Intergroup Relations and Religion
William A. Darity Jr., Racial and Ethnic Economic Equality across Countries, Motivation and Labor Market Outcomes, Schooling and Social Stratification
Anne S. Hastings, Senior Lecturer, Family, Race and Ethnicity, Social Stratification
Gail Henderson, Medical Sociology (including Social and Economic Determinants of Health and Health Services Utilization), Health and Health Care in China, Social Contexts and Factors Related to Research Ethics
Amy Hess, Gender
James Johnson, Public Policy, Urban Sociology, Social Geography
Robert Miles, Comparative Sociology/Historical Sociology, Racialized and Minority Relations, Migration and Immigration
Christian Smith (54) Sociology of Religion, Culture Sociology, American Adolescents, Social Movements, Mixed Methods
John D. Stephens, Political Sociology, Political Economy, Comparative and Historical
Catherine Zimmer, Quantitative Methodology, Formal Organizations and Sociology of Work

Professors Emeriti

Amos H. Hawley
Henry A. Landsberger
Gerhard Lenski
Duncan MacRae Jr.
Anthony Oberschall
John Shelton Reed
Richard L. Simpson
James A. Wiggins

The Department of Sociology offers the master of arts and doctor of philosophy degrees in sociology. Students receive training that equips them for careers in both teaching and research. All sociology students take basic course work in sociological theory, research methods and statistics, and substantive areas. The program emphasizes balanced training and the integration of theory, method and substantive knowledge. Detailed information on graduate degree procedures is available online at www.unc.edu/depts/soc. For further information, including information about financial aid for students, contact the department's administrative assistant for student services.

The department's main concentrations of faculty research interest and graduate training are in comparative social organization and societal change, demography, research methods and social statistics, labor force and industrial relations, and stratification and complex organizations.

A large proportion of first-year students (as well as more advanced students) receive financial assistance. Sources of aid include teaching assistantships, research assistantships and nonservice fellowships.

The department works closely with the Carolina Population Center, the Odum Institute for Research in Social Science and the University Computation Center. The department maintains the Odum Computer Laboratory for training and research. Computer programming assistance, consultation and computing services are available without charge for student research. The department also sponsors and edits Social Forces, a national sociological journal.

Courses for Graduates and Advanced Undergraduates

390 [199] SOCIOLOGICAL ANALYSIS: SPECIAL TOPICS (3). Examines selected topics from a sociological perspective. The course description for a particular semester is available in the departmental office. Staff.

410 [110] FORMAL ORGANIZATIONS AND BUREAUCRACY (MNGT 410) (3). Varieties of organizational forms, their structures and processes; creation, persistence, transformation and demise; role of organizations in contemporary society. Aldrich, Nielsen, Blau.

411 [111] SOCIAL MOVEMENTS AND COLLECTIVE BEHAVIOR (3). Study of nonroutine collective actions such as demonstrations, strikes, riots, social movements and revolutions, with an emphasis on recent and contemporary movements. Kurzman, Nielsen.

412 [112] SOCIAL STRATIFICATION (MNGT 412) (3). Analysis of social structure and stratification in terms of class, status, prestige and rank. Attention to social roles of elites, professionals, the middle class and the working class and to comparative topics. Aldrich, Mouw.

414 [114] THE CITY AND URBANIZATION (3). The city as a social, spatial and political-economic phenomenon in the modern world. Analysis of urban demographic trends, spatial characteristics and economic functions. Substantive topics include segregation, social turmoil, unemployment, fiscal problems, suburbanization and urban public policy. Blau.

415 [115] ECONOMY AND SOCIETY (MNGT 415) (3). Examination of the structure and operation of institutions where economy and society intersect and interact, such as education, industrial organizations, on-the-job training, labor markets and professional associations. Emphasis on the contemporary United States, with selected comparisons with Western Europe and Japan. Mouw.

419 [119] SOCIOLOGY OF THE ISLAMIC WORLD (3). Investigates issues such as tradition and social change, religious authority and contestation, and state building and opposition in Muslim societies in the Middle East and around the world. Kurzman.

420 [120] POLITICAL SOCIOLOGY (3). Analysis of the reciprocal influences of state and social organizations upon each other; the social bases of political authority and stability, of revolution and counterrevolution. Perrin.

422 [122] SOCIOLOGY OF HEALTH AND MENTAL ILLNESS (3). Course examines uniqueness of the sociological perspective in understanding mental health and illness. It draws upon various fields to explain mental illness in as broad a social context as possible. Attention focuses on how social factors influence definitions and perceptions of illness. Staff.

423 [123] SOCIOLOGY OF EDUCATION (3). An overview of theory and research on education and schooling, with an emphasis on inequalities in educational opportunities, education as a social institution and the changing context of schools and schooling. Tyson.

424 [124] LAW AND SOCIETY (3). A sociological analysis of comparative legal systems, the role of law in social change and in shaping social behavior. Topics may include the legal profession, property distribution and the role of law in achieving racial and sexual justice. Staff.

425 [125] FAMILY AND SOCIETY, JUNIOR/SENIOR SECTION (3). A special version of SOCI 130 for juniors, seniors and beginning graduate students. Students may not receive credit for both this course and SOCI 130. Rindfuss, Uhlenberg.

427 THE LABOR FORCE (MNGT 427) (3). Supply and characteristics of labor and of jobs, including industrial and occupation changes, education and mobility of labor and changing demography of the workforce. Kalleberg, Blau.

428 [128] SOCIOLOGY OF ART (3). Connections between artworks, art theory and social theory are examined. Approaches in the fine arts and the social sciences are examined. Staff.

429 RELIGION AND SOCIETY (RELI 429) (3). Sociological analysis of group beliefs and practices, both traditionally religious and secular, through which fundamental life experiences are given coherence and meaning. Staff.

431 [131] AGING (3). The process of aging from birth to death, with a concentration on the later years of life, examined from a broad perspective. Topics include individual change over the life course, the social context of aging and the aging of American society. Uhlenberg.

439 [118] COMPARATIVE EUROPEAN SOCIETIES (POLI 439) (3). Examination of commonalities and differences of European societies and of the tensions and difficulties attending the European integration process. Nielsen, Marks.

442 [143] CONFLICT AND BARGAINING (PWAD 442) (3). Conflict and conflict-resolution behavior. Applications to labor-management relations, family, sports, community politics, international relations. Staff.

444 [129] RACE, CLASS, AND GENDER (WMST 444) (3). Conceptualizations of gender, race and class and how, separately and in combination, they are interpreted by the wider society. Emphasis on how black and working-class women make sense of their experiences at work and within the family. Kleinman.

445 [145] SOCIOLOGY OF EMOTIONS (3). The course examines how emotions are organized within social groupings and institutions. Differences in socialization by gender, ethnicity, social class and age will be explored. Kleinman.

450 [150] THEORY AND PROBLEMS OF DEVELOPING SOCIETIES (3). Theories concerning the development process (motivational vs. institutional economics vs. political and social development; similarity of sequential states and outcomes) will be related to policy problems facing the developing nations. Bollen.

453 [153] SOCIAL CHANGE IN LATIN AMERICA (3). Introduction to Latin American ideologies and values; economic and demographic changes; major pressure groups (old elites, entrepreneurs, peasants and working classes, military and intellectuals); and relations with the United States. Staff.

460 [160] CONTEMPORARY SOCIAL THEORY (3). Prerequisite, SOCI 250. Analysis of current problems in general social theory; action and structure, justice and equity, social change and reproduction. Contrast and evaluation of leading approaches to solutions. Bollen, Kurzman.

468 [168] UNITED STATES POVERTY AND PUBLIC POLICY (3). This course examines issues of poverty and social policy, single-mother families, the welfare debate and homelessness. Students are required to participate in the APPLES service-learning program as part of the course. Fall. Harris.

469 [169] MEDICINE AND SOCIETY (3). The primary objective of the course is to explain why particular social arrangements affect the types and distribution of diseases and how the medical care system is organized and responds. The course will focus on three topics: social factors in disease and illness; health care practitioners and their patients; and the changing face of the health care system Staff.

481 [281] MANAGING INTERNATIONAL CONFLICT (3). This course introduces the principles of international cooperation and conflict resolution; theories of how international agreements develop or break down; and the logic of mediation, arbitration and negotiation. Staff.

Courses for Graduates

700 [200] HISTORY OF SOCIAL THOUGHT (3). Prerequisite, graduate standing in sociology or written permission of the instructor. Historic social ideas of Western culture are considered against a background of general cultural analysis in terms of systematic theory. Required of all graduate degree candidates in sociology. Kurzman.

707 [207] MEASUREMENT AND DATA COLLECTION (POLI 778) (3). Provides an introduction to measurement theory and a review of various methods of data-gathering. Gaining experience with a variety of techniques of measurement and preparing a pretested research proposal are required for all students. Entwisle.

708 [208] STATISTICS FOR SOCIOLOGISTS (3). Provides an introduction to probability theory, descriptive statistics, inferential statistics and the algebra of expectations. Emphasis is on elements useful to research sociologists, including bivariate regression and correlation. Nielsen.

709 [209] LINEAR REGRESSION MODELS (HPAA 882) (3). The course presents regression analysis and related techniques. The major topics are the assumptions of the regression model, dummy variables and interaction terms, outlier diagnostics, multicollinearity, specification error, heteroscedasticity and autocorrelation. The final section introduces path analysis, recursive models and nonrecursive systems. Bollen, Guo, Nielsen.

711 [211] ANALYSIS OF CATEGORICAL DATA (HPAA 881) (1–3). Prerequisite, permission of the instructor. Introduction to techniques and programs for analyzing categorical variables and nonlinear models. Special attention is given to decomposition of complex contingency tables, discriminant function analysis, Markov chains and nonmetric multidimensional scaling. Bollen, Guo.

715 [312] SEMINAR ON SOCIAL NETWORKS (3). Prerequisite, permission of the instructor. Theoretical and substantive issues in social network analysis. Focus is on models of social structure. Staff.

717 [317] STRUCTURAL EQUATIONS WITH LATENT VARIABLES (3). Prerequisites, SOCI 708 and permission of the instructor. This course examines models sometimes referred to as LISREL models. Topics include path analysis, confirmatory factor analysis, measurement error, model identification, nonrecursive models and multiple indicators. Bollen.

718 [318] LONGITUDINAL AND MULTILEVEL DATA ANALYSIS (3). Prerequisite, SOCI 709, 711 or equivalent. This course provides an introduction to event history analysis or survival analysis, random effects and fixed effects models for longitudinal data, multilevel models for linear and discrete multilevel data and growth curve models. Bollen, Guo.

720 [320] SYSTEMATIC METHODS OF QUALITATIVE RESEARCH (3). Course designed to teach methods of data collection and analysis for qualitative research. Kleinman, Tyson.

753 [253] EXPERIMENTAL DESIGN IN SOCIOLOGY (3). Prerequisite, permission of the instructor. Statistical aspects of experimental designs, with emphasis on applied problems involved in executing a statistically sound design. (On demand.) Staff.

754 [254] SURVEY SAMPLING (3). Prerequisite, permission of the instructor. The different sampling techniques are discussed. Major emphasis on planning of large-scale sample surveys rather than on statistical theory. (On demand.) Staff.

760 [250] DATA COLLECTION METHODS (3). Reviews alternative data collection techniques used in surveys, concentrating on the impact these techniques have on the quality of survey data. Topics covered include errors associated with nonresponse, interviewing and data processing. Staff.

761 [251] QUESTIONNAIRE DESIGN (3). Examines the stages of questionnaire design including developmental interviewing, question writing, question evaluation, pretesting, questionnaire ordering and formatting. Reviews the literature on questionnaire construction. Provides hands-on experience in developing questionnaires. Staff.

762 [252] CASE STUDIES IN SURVEYS (3). A number of external speakers from government and industry will describe various problems they encounter in surveys. Students will be challenged to develop proposals for addressing the problems, citing the literature as appropriate. Staff.

763 [255] SURVEY COMPUTING (3). Introduces basic statistical concepts and practices emphasizing the analysis of real data. Provides training in the use of the SAS statistical analysis system and the practical problems of stratification, clustering and weighting in survey analysis. Staff.

800 [203] CURRENT ISSUES IN SOCIAL THEORY (3). An examination of selected recent work of general significance in sociology. Themes vary. Kurzman.

801 [215] EVOLUTIONARY THEORY (3). Introduction to the new evolutionary theory and associated research. Staff.

802 [217] SOCIAL PSYCHOLOGICAL THEORY (3). Introduction to basic theoretical approaches in social psychology, including social learning, social exchange, symbolic interaction, cognitive consistency and affect control. Kleinman.

803 [218] HUMAN ECOLOGY (3). Examination of how human populations adapt to their environments. Emphasis on linkages among population, organization, environment and technology. Research applications of this approach to urban communities and organizations. Blau, Nielsen.

804 [214] MARX AND MARXISM (2). Brief exposition and evaluation of Marx's theory of human nature, societal change and evolution, class, the state, family and other institutions. Summary of dependency theory and critical theory. Staff.

806 [204] PRINCIPLES OF THEORIZING (3). This course in metatheory analyzes methods of theorizing. It examines the criteria for constructing and evaluating scientific theories developed by philosophers of science and applies them to social theorizing. The hypothetico-deductive model of theorizing is contrasted with other theoretical approaches. Staff.

807 [202] MAJOR SOCIOLOGICAL THEORIES (0.5–21). Examination of selected writing, concepts and issues of a major sociological theory or theoretical approach. Staff.

808 [205] MACROSOCIOLOGICAL THEORY (3). The objective of the course is to illustrate three aspects of macrosociological theory: 1) the conception of macrosociology, 2) the structural approach in sociology and 3) hypothetico-deductive theorizing. A hypothetico-deductive macrostructural theory developed by the instructor is analyzed, and extensive empirical tests of the theory are presented. Staff.

810 [234] SOCIAL MOVEMENTS (3). The structure and dynamics of social movements and their societal environment, with special reference to sociopolitical movements of minority and low status groups in industrialized and third world societies. Kurzman, Nielsen.

811 [311] SEMINAR IN POLITICAL SOCIOLOGY (POLI 811) (3). The relationships between social structure and political decisions. Regimes and social structure; bureaucracies, political associations and professions; science and politics; closed and open politics; political movements and change. Kurzman, Stephens.

812 [265] CIVIL SOCIETY (1–3). Under the conditions of globalization, civil society takes on new and different meanings. Course examines what the term means and how it is applied.

813 [221] COMPARATIVE WELFARE STATES (POLI 813) (3). This course examines the development, achievements, present crisis and likely future of welfare states in advanced industrial democracies. Stephens.

814 [308] SEMINAR IN COMPARATIVE AND HISTORICAL SOCIOLOGY (3). Prerequisite, permission of the instructor. Examination of issues involved in societal comparison, with an emphasis upon comparative and historical analysis of substantive issues at the macro-societal level. Special attention is given to methodological problems. Kurzman.

816 [220] INFLUENTIAL WORKS IN DEMOCRACY (POLI 816) (3). The course covers the major traditions of democratic theory from ancient Greece to the present, ethnographies on political organization and 19th- and 20th-century observations on democracy. Bollen, Staff.

821 [270] THE LIFE COURSE (3). Provides an intense introduction to the life course as a theoretical orientation and methodology (logic of inquiry). Elder.

820 [333] SEMINAR IN MARRIAGE AND THE FAMILY (3). (On demand.) Uhlenberg.

822 [280] SOCIOLOGICAL THEORIES OF AGING AND THE ADULT LIFE COURSE (3). Overview and critical assessment of sociological theory applied to aging, including explicit theories of aging. The course examines the historical development of the field and considers the nature of theory development. Marshall.

830 [212] DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART I (3). A basic introduction to the discipline of demography. Materials covered include population history, data sources, mortality and fertility trends, and differentials and techniques of analysis. Entwisle, Harris, Pearce, Rindfuss, Uhlenberg.

831 [213] DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART II (3). A continuation of SOCI 830. Materials covered include population growth and stable population theory, migration and distribution, population policy, and population estimates and projections. Entwisle, Mouw, Rindfuss, Uhlenberg.

832 [287] MIGRATION AND POPULATION DISTRIBUTION (3). Treats migration trends, patterns, and differentials and their effects on population distribution in continental and regional areas. Attention is given to theoretical and methodological problems in the study of population movement. (On demand.) Uhlenberg.

833 [289] SOCIOECONOMIC FACTORS IN FERTILITY (3). Study of fertility differentials by social and economic factors, changes over time, the manner in which these factors affect fertility and the implications thereof for fertility-control programs. (On demand.) Entwisle, Rindfuss.

835 [290] MORTALITY: SOCIAL DEMOGRAPHIC PERSPECTIVES (3). Prerequisite, SOCI 830 or equivalent, or permission of the instructor. This advanced seminar covers mortality date and measurement, the inequality of death, trends in morbidity and mortality and explanations of mortality decline. Social demographic perspectives receive primary emphasis. Entwisle, Guo.

836 [263] SOCIAL GERONTOLOGY (3). Prerequisite, permission of the instructor. The study of the aged in our society. Uhlenberg.

840 [223] SOCIAL ATTITUDES (3). Basic theories and methods in attitude research, with special attention to attitude dynamics and social relations. Staff.

841 [229] SOCIAL STRUCTURE AND PERSONALITY (3). The generic processes by which individuals become members of a society, with emphasis on the influence of social structure on socialization and the patterning of personality. Elder, Kleinman.

842 [329] SEMINAR IN SOCIALIZATION AND GROUP PROCESS (3). Prerequisite, permission of the instructor. Analysis of theoretical issues and empirical research relevant to socialization. Special emphasis upon group process effects on the evolution of the social self, the "fit" between personality and role, and other issues. Kleinman.

843 [314] SEMINAR IN SOCIAL CONTROL AND DEVIANCE (3). Registration by permission of the instructor. The relation of social norms to conforming and deviant behavior. Types of social and personal controls. Theoretical and research problems are reviewed. Staff.

850 [230] SOCIAL STRATIFICATION (3). Prerequisite, SOCI 420 or equivalent. Analysis of major theories of and approaches to the study of social inequality, with attention to how the various theories and approaches are operationalized. Focus on recent research in labor markets and worldwide inequality. Mouw, Nielsen.

851 [231] SOCIOLOGY OF GENDER (WMST 851) (3). Reviews theory on variation in men's and women's gender roles, with emphasis on industrialized societies and women's roles. Cohen.

852 [268] ETHNICITY, RACE AND EDUCATION (1–21). Emerging new theory and research paradigms in the sociology of education are reviewed. The course covers the following: racial and ethnic variation, parenting, contextual variation, peer influence and school variation. Blau, Tyson.

853 [232] JUSTICE AND INEQUALITY: SELECTED TOPICS (1–21). Prerequisite, permission of the instructor. Examination of selected issues regarding societal, economic and political inequality and questions of justice in the United States and Western Europe. Staff.

854 [274] SEMINAR IN URBAN SOCIOLOGY (3). Theory and research in the study of the location and growth of urban areas, the effect urban areas have upon behavior, and the study of social behavior in different urban subareas. Each member of the seminar completes a project interrelating theory and research. Staff.

855 [313] POVERTY IN AMERICA (3). This graduate seminar will study trends, causes and consequences of poverty in America, covering the topics of single-mother families, child poverty, low-wage work, immigrant families, and welfare reform and social policy. Harris.

860 [245] SOCIOLOGY OF ORGANIZATIONS (3). Prerequisite, permission of the instructor. Structural features of organizations. Behavior in organizations. Organizational career patterns. Comparative analysis of structure, behavior and careers in different types of organizations. Interorganization and organization-environment relations. Aldrich.

861 [246] OCCUPATIONS AND WORK (3). The changing occupational system. Structural types of labor markets. Occupational organization, role sets, power relations, careers and satisfaction in different types of labor markets and occupations. Kalleberg.

862 [260] HEALTH ORGANIZATIONS AND OCCUPATIONS (3). Considers various treatment settings, socialization and job performance of health workers, patienthood, the relation between organizational structure and effectiveness, and professional self-regulation. Staff.

863 [248] MEDICAL SOCIOLOGY: HEALTH, ILLNESS AND HEALING (3). This graduate seminar presents a conceptual and substantive overview of some of the most fundamental and salient issues in the field of medical sociology. The focus of the course is on continuity and change in health and health care. The following topics will be examined: social causation of disease, medicalization of social problems, medicine as a profession, treatment systems and organization of care, politics and the changing face of the medical care system.Staff.

870 [266] SOCIOLOGY OF CULTURE (3). Focuses on substantive and theoretical issues in this field and their intellectual origins. Topics include organizations, art, religion, science, class and politics. Quantitative and qualitative approaches are examined. Blau.

871 [267] SOCIOLOGY OF RELIGION (3). An introductory, graduate-level survey of the sociology of religion as a field of study, reviewing literature on important theoretical approaches and key problems and issues in the field. Fall. Staff.

872 [247] THE SOCIOLOGY OF SCIENCE: SCIENCE AS A SOCIAL AND CULTURAL ACTIVITY (3). This course examines the production of scientific knowledge. The focus is on the processes by which scientific knowledge and technological artifacts are constructed through cultural practices and the organizational of scientific work. Staff.

901 [321] FIELD RESEARCH (3 each semester). Registration by permission of the instructor.

905 [319] SURVEY PRACTICUM (3). Applied workshop in sample survey design and implementation. The student works in a data collection center under the guidance of the instructor. Course focuses on real world problems in data collection and their practical, cost-effective solutions. Staff.

950 [326] SEMINAR IN SELECTED TOPICS (3). The course description for a particular semester is available in the departmental office. Registration by permission of the instructor. Staff.

960 [300] TRAINING PROGRAM SEMINARS (1). Continuing seminars in selected topics. Staff.

961 [301] READING AND RESEARCH (1–3). Registration by permission of the instructor.

962 [302] 963 [303] ADVANCED READING. Library research or field research on a selected topic under guidance of the instructor. Staff.

970 [315], 971 [316] READING AND RESEARCH IN METHODOLOGY (3 each semester). Registration by permission of the instructor. Special work on selected problems of research methodology. Staff.

980 [380] SEMINAR ON THE TEACHING OF SOCIOLOGY (3). Prerequisite, doctoral candidacy in sociology or permission of the instructor. Examines the teacher's role and the teaching process, planning a course and constructing syllabi, testing for teaching or grading, evaluating teacher performance and the needs of different student populations. Aldrich.

993 [393] MASTER'S THESIS (3–6). Individual research in a selected field under the direction of a member of the department. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Individual research in a selected field under the direction of a member of the department. Staff.

Interdisciplinary Courses for Advanced Undergraduates and Graduates

SOCI 824 [604] AGING AND HEALTH (DENT 604I, PHCY 604I, EPID620I, HMSC 904I, MEDI 604I, NURS 782I, PHYT 904I, PSYC 904I, SOWO 604I) (3). Sponsored by UNC–Chapel Hill's campus-wide Institute on Aging. The course provides students in all disciplines with a general background in aging and the problems of older persons. Staff.

Division of Speech and Hearing Sciences

www.med.unc.edu/ahs/sphs
JACKSON ROUSH, Director

Professors
Elizabeth R. Crais (48) Language Development and Disorders in Infants, Toddlers, and Preschoolers; Working with Families in Early Intervention
Melody Harrison (40) Early Speech, Language, and Auditory Development in Children with Hearing Loss
Lee McLean, Early Intervention and Language Development in Children
Patricia Porter, Augmentative and Alternative Communication (AAC), Speech/Language of Persons with Developmental Disabilities, Public Policy.
Jackson Roush (59) Pediatric Audiology, Early Intervention

Associate Professors
Karen Erickson (45) Assessment of Reading and Writing, Literacy Instruction
Katarina L. Haley (41) Speech Perception and Production, Neurogenic Communication Disorders
Linda R. Watson (67) Language Disorders in Young Children, Autism, Emerging Literacy
David Zajac (63) Speech Aerodynamics, Developmental Aspects of Speech Production, Cleft Palate Research

Assistant Professors
Lisa Domby, Phonology, Bilingual Learning
Lori Leibold (09) Developmental Psychoacoustics, Pediatric Audiology.
Molly Losh, Language and Social Cognition in Neurogenic Disorders
Nancy McKenna, Genetics, Hearing Disorders
Brenda Mitchell (80) Adult Neurogenic Disorders, Community Re-Entry for Adults, Clinical Supervision
Martha Mundy, Educational and Pediatric Audiology, Otitis Media Research.
Debra R. Reinhartsen (71) Augmentative Communication, Low-Incidence Disabilities
Stephanie Sjoblad, Aural Rehabilitation, Hearing Aids and Assistive Devices
Sharon Williams (74) Geriatrics, Communication Disorders of Older Adults, Multicultural Issues, Counseling
Barbara Winslow, Hearing Aid Technologies and Management of Adult Hearing Loss

Research Professors
Joseph W. Hall (53) Audiology and Psychoacoustics Research
Robert W. Peters, Auditory and Speech Perception, Sensation and Perception, Stuttering
Charles Finley (62) Cochlear Implant Processing Strategies
Joanne E. Roberts (53) Early Language Development and Disorders, Otitis Media
John H. Grose (50) Audiology and Psychoacoustics Research

Instructor
Kathryn Wilson, Childhood Hearing Loss

Adjunct Associate Professor
Emily Buss (90) Psychoacoustic Research

Adjunct Assistant Professors
Mark M. Haythorn, Diagnostic Audiology
Holly Teagle, Cochlear Implants in Children
Adjunct Clinical Instructors
Carolyn Brown, Cochlear Implants in Children
Brian Kanapkey, Dysphagia, Neurogenic Speech Disorders
Holly Teagle, Cochlear Implants in Children

The Division of Speech and Hearing Sciences in the School of Medicine's Department of Allied Health Sciences provides academic and professional education for speech-language pathologists and audiologists. Programs of study are available at the master's and doctoral levels in speech language pathology. Both clinical (Au.D.) and research (Ph.D.) doctoral degrees are offered in audiology. The study of speech and hearing requires knowledge in both normal and abnormal speech, hearing and language. The speech and hearing sciences curriculum provides a multifaceted learning environment including classroom, laboratory, and clinical experiences. Three major tracks of study are possible within the curriculum: audiology, speech-language pathology and speech and hearing sciences. There are three academic degree programs: 1) a master's degree (M.S.) for entry-level clinical practice of speech-language pathology, 2) a professional doctorate (Au.D.) for entry-level clinical practice in audiology and 3) a Ph.D. in speech and hearing sciences, for individuals with a background in speech-language pathology or audiology who desire a research degree. All the programs are interdisciplinary, involving clinical and research activities with other University departments and institutions, in addition to the Division of Speech and Hearing Sciences.

The entrance, academic and residence requirements for the M.S. and Ph.D. degrees correspond to those of The Graduate School. Applicants to the Au.D. program follow the guidelines established by the School of Medicine. All students enrolled in professional tracks (M.S. and Au.D.) are prepared to meet licensure and certification requirements necessary for the practice of speech-language pathology or audiology. More complete information describing the graduate program can be obtained on the Web at www.med.unc.edu/ahs/sphs.

Courses for Graduates and Advanced Undergraduates

530 [130] INTRODUCTION TO PHONETICS (COMM 530) (3). A detailed study of the International Phonetic Alphabet with emphasis on the sound system of American English. Application of phonetics to problems of pronunciation and articulation. Includes broad and narrow phonetic transcription. Fall. Staff.

540 [140] SPEECH SCIENCE (COMM 540) (3). Introduction to the science of speech, including production, acoustics and perception. Spring. Haley.

570 [170] ANATOMY AND PHYSIOLOGY OF THE SPEECH, LANGUAGE AND HEARING MECHANISMS (COMM 570) (3). Anatomy and physiology of the speech-producing and aural mechanisms. Fall. Harrison.

582 [123] INTRODUCTORY AUDIOLOGY I (COMM 582) (3). Theory and practice of the measurement of hearing, causative factors in hearing loss, evaluation of audiometric results and demonstration of clinical procedures. Spring. Roush.

583 [183] INTRODUCTION TO COMMUNICATION DISORDERS. Introduction to diagnosis and treatment of communication disorders, including articulation, fluency, voice and language, and those resulting from autism and hearing loss. Spring. Mitchell.

Courses for Graduates

701 [201] INTRODUCTION TO RESEARCH IN SPEECH AND HEARING (3). Prerequisite, statistics course. Experimental and descriptive research designs in speech and hearing sciences, including both group and single subject. Spring. Leibold.

704 [304] CLINICAL ISSUES AND EXPERIENCE IN SPEECH-LANGUAGE PATHOLOGY (1–3). Permission of practicum coordinator. Supervised clinical experience and professional issues. May be repeated for credit. Fall, spring and summer.

706 [306] CLINICAL PRACTICUM IN AUDIOLOGY (1–3). Prerequisite, permission of practicum coordinator. Supervised clinical experience. May be repeated for credit. Fall, spring, and summer. Winslow.

708 [208] PEDIATRIC COCHLEAR IMPLANTS (2). Prerequisites, SPHS 803 and 721. Examines fundamentals of cochlear implants, candidacy, evaluation, equipment, programming and performance outcomes. Spring. Teagle.

710 [310] AUDIOLOGIC EVALUATION I (3). Prerequisite, SPHS 582 or equivalent. Clinical audiology techniques including speech, audiometry and special auditory tests. Masking is covered in depth, as well as consolidation of clinical skills for diagnostic and rehabilitative purposes. Fall. Mundy.

712 [312] CHARACTERISTICS OF AMPLIFICATION SYSTEMS (3). Amplification options for the hearing-impaired; specifically, hearing aid, electroacoustics and earmold technologies. Additionally, hearing aid selection procedures are presented. Spring. Winslow.

717 [317] PROFESSIONAL CONSIDERATIONS IN SPEECH AND HEARING (3). To provide the student with information about current issues facing professionals. Issues include changing delivery systems, leadership, treatment efficacy and quality, reimbursement and ethics. Spring. Staff.

721 [221] PHYSIOLOGICAL AND PSYCHOLOGICAL BASES OF HEARING (3). Auditory function, anatomy and physiology of the auditory system, auditory processing at the psychoacoustic level. Spring. Grose.

725 [225] HEARING DISORDERS (2). Prerequisite, SPHS 582 or equivalent. Diseases and disorders of the auditory system and their management. Spring. McKenna.

726 [326] CLINICAL ISSUES AND EXPERIENCES IN AUDIOLOGY (1). Online course covering universal precautions, privacy regulations, clinical practice with diverse cultural groups, report writing and other aspects of audiology practice. Fall, summer. Winslow, Mundy.

733 [283] AUDITORY STRATEGIES FOR SPOKEN LANGUAGE IN DEAF CHILDREN (1). Instruction and application of a variety of topics demonstrating the use of auditory techniques, and strategies to promote the use of spoken language in children with hearing loss. Eskridge. Spring.

737 [337] NORMAL ASPECTS. This course provides an overview of normal development of speech, language and audition for children from birth to eight years old. It will also address the impact of hearing loss on those domains.

740 [240] COMMUNICATION DEVELOPMENT (3). Predominant theoretical models of communicative development are the basis for investigating how linguistic and nonlinguistic developmental and environmental influences affect communication development. Fall. Waston.

741 [241] NEUROANATOMY (3). Prerequisite, SPHS 570 or equivalent. A survey of neurological anatomy in relation to clinical speech-language pathology. Topics considered include organization of the CNS, neuroanatomy, neurophysiology and neurochemistry. Spring. Harrison.

742 [342] APHASIA (3). Prerequisite, SPHS 570 or equivalent. Discussion of adult aphasia and its clinical management, including assessment, diagnosis, prognosis, counseling and treatment. Combined lectures and laboratories. Spring..Staff.

743 [343] PHONOLOGICAL DEVIATIONS: ASSESSMENT AND MANAGEMENT (3). Prerequisites, SPHS 530, SPHS 570. Course deals specifically with the major diagnostic tests of articulation and the specific management programs associated with each. Thorough examination of the research supporting each test and treatment plan is included. Spring. Domby.

744 [344] MOTOR SPEECH DISORDERS (3). Prerequisites, SPHS 540, SPHS 570. Assessment and treatment of adults presenting with disorders of motor speech control (i.e., dysarthria, anarthria and apraxia of speech). Fall. Haley and Pierce.

745 [345] PRINCIPLES OF DIAGNOSIS AND INTERVENTION (3). Diagnostic procedures focusing on interviewing, counseling, report writing and standard measures. Intervention procedures focusing on establishing goals, criteria for success, documentation of progress, discharge planning and therapy strategies. Fall. Domby.

748 [348] VOICE AND FLUENCY DISORDERS (2–4). Prerequisites, SPHS 540, SPHS 570. Assessment and management of children and adults with fluency or voice disorders (including laryngectomy). Spring. Staff.

749 [349] EVALUATION AND CLINICAL MANAGEMENT OF PERSONS WITH ORAL-FACIAL ANOMALIES (3). Prerequisites, SPHS 540, SPHS 570. In-depth analysis of the embryologic and physiologic bases of oral-facial anomalies and the team approach to assessment and habilitation. Particular emphasis placed upon the following specialties: genetics, plastic surgery, prosthodontics, orthodontics, otolaryngology and speech-language pathology. Spring. Zajac.

752 [352] COGNITIVE LINGUISTIC PROCESSING DISORDERS IN ADULTS (3). Prerequisite, SPHS 342 or equivalent. Discussion of normal aging and language. Assessment and treatment of cognitive and linguistic problems in persons with dementing conditions, right hemisphere dysfunction and traumatic brain injury. Spring.

754 [354] DYSPHAGIA (3). Prerequisite, SPHS 742. Discussion of the development of the normal swallow, anatomy and physiology of the swallowing mechanism, and assessment and team management of swallowing disorders. Spring. Kanapkey.

760 [260] ADULT COMMUNICATION DISORDERS (3). Overview of communication disorders commonly seen in adult populations. These include disorders of language, cognition, speech and motor control, voice and fluency. Fall. Haley.

761 [261] CHILD COMMUNICATION DISORDERS (3). Disorders of child speech and language development, as a prerequisite for advanced specialized course work and supervised clinical practicum. Fall. Domby.

762 [362] LANGUAGE AND LEARNING DISORDERS (3). Prerequisite, SPHS 162 or equivalent. Course in normal and abnormal learning from a language perspective. Emphasis on evaluation and treatment from a psycholinguistic model. Spring. Erickson.

765 [265] AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (3). Prerequisite, SPHS 347 or equivalent. A comprehensive look at the theoretical and clinical issues related to augmentative/alternative communication. Techniques and strategies to provide effective communication for the severely handicapped are discussed. Fall. Erickson.

802 [302] PROBLEMS IN SPEECH AND HEARING SCIENCES (1–3). May be repeated for credit. Fall, spring and summer. Staff.

803 [203] AUDIOLOGIC REHABILITATION FOR CHILDREN (3). Prerequisite, SPHS 582. Covers speech perception and the effects of hearing loss on perception and production of speech as background for understanding assessment and treatment, with an auditory-verbal emphasis. Pediatric assessment and amplification are reviewed. Spring. Harrison.

804 [204] AUDIOLOGIC REHABILITATION FOR ADULTS (3). Theoretical bases and history of audiologic rehabilitation of adults. Also, practical

approaches to assessment and therapeutic intervention are presented. The roles of assistive technology and family-based counseling are included. Fall. Sjoblad.

806 [206] COMMUNICATION ASSESSMENT AND INTERVENTION WITH CHILDREN BIRTH TO FIVE (3). Stages of communication development of children from birth to five years old; clinical issues related to the assessment tools and intervention and planning for children with disabilities and their families. Fall. Crais.

811 [311] PEDIATRIC AUDIOLOGY (3). Prerequisite, SPHS 710 or equivalent. Clinical procedures used in the identification and management of hearing loss in young children. Spring. Liebold, Roush.

813 [313] FITTING AND DISPENSING OF AMPLIFICATION SYSTEMS (3). Prerequisite, SPHS 712 or equivalent. Theoretical and practical approaches to fitting amplification systems and the procedures for dispensing amplification systems to the hearing-impaired. Fall. Sjoblad.

814 [314] AUDITORY EVOKED POTENTIALS I (3). Prerequisites, SPHS 721 and SPHS 710. This course explores the field of electrophysiologic responses within the auditory and vestibular systems. Auditory brainstem response (ABR), electrocochleography (ECoG), electroencephalography (EEG), and otoacoustic emissions (OAE) are covered. Spring. Grose.

815 [315] AUDIOLOGY FOR SPECIAL POPULATIONS (3). Prerequisite, SPHS 582 or equivalent. Advanced principles of pediatric audiology and intervention strategies for hearing-impaired children. Procedures for counseling and case management. Spring of even-numbered years (beginning in 2008).

816 [316] INDUSTRIAL AUDIOLOGY AND HEARING CONSERVATION (2). Prerequisite, SPHS 582 or equivalent. Military and industrial audiology and hearing conservation, including physiological and psychological factors. Spring. Winslow.

818 [318] BALANCE ASSESSMENT AND REHABILITATION (3). Principles of vestibular function and dysfunction, clinical assessment and management. Fall. Staff.

819 [319} EDUCATIONAL AUDIOLOGY (3). Examines the provision of services to school-age children, with special focus on ALDs used by hearing impaired students in school settings and the assessment of central auditory perception. Spring. Mundy.

820 [320] INSTRUMENTATION AND CALIBRATION (2). Principles of instrumentation relevant to clinical practice including study of electronics, filters and analog and digital processing. Summer. Liebold.

821 [321] SEMINAR IN AUDIOLOGY. Special topics and significant literature in the field of audiology. (On demand.) Staff.

822 [322] SPECIAL TOPICS IN AUDIOLOGY (2). Examines the impact of genetics, pharmacology, intraoperative monitoring, hair cell regeneration, imaging and recent amplification technologies on current and evolving audiology practice. Fall. Mundy.

823 [323] BUSINESS MANAGEMENT AND PROFESSIONAL ISSUES (2). Examines healthcare and business models that impact audiology practice. Personnel management, marketing, quality assurance and service reimbursement for audiology practices will be covered. Spring. Sjoblad.

824 [324] AUDIOLOGY GRAND ROUNDS (1). Examines clinical cases from the perspective of presenting symptoms, test results and clinical outcomes. Spring. Mundy.

830 [330] INDEPENDENT STUDY (1–6). This course gives enrolled graduate students in the curriculum an opportunity to pursue research supervised by one or more faculty members, culminating in a written document or special project. Fall, spring and summer. Staff.

832 [332] SPEECH ACOUSTICS. This course provides information on the fundamentals of speech production, including the acoustic characteristics of normal and disordered speech. Prerequisite, SPHS 333. Spring.

833 [333] SPECIAL TOPICS. This is the foundation course in a series related to providing services to children with hearing loss. Six units focus on working with families, speech acoustics, audiological interpretation, instrumentation, foundations of speech and language and early literacy. Spring.

834 [334] COUNSELING AND COMMUNICATION DISORDERS (3). This course focuses on providing a broad overview of contemporary counseling issues in communication disorders. The course will promote an understanding of the ways that interviewing and counseling skills appropriate to the age, life course and cultural background of the client and family can facilitate the adjustment of individuals and families. Spring. Staff.

840 [340] AGING AND COMMUNICATION DISORDERS (3). This course focuses on medical, psychological and social theories and aspects of aging as they relate to communication processes and disorders. Fall. Williams.

841 [341] SEMINAR IN SPEECH-LANGUAGE PATHOLOGY (Var.). Special topics and significant literature in the field of speech pathology. (On demand.) Staff.

855 [355] NEUROPSYCHOLOGY FOR SPEECH-LANGUAGE PATHOLOGISTS. The study of brain/behavior relationships as it relates to adults with acquired neurologic communication disorders; the domains of cognition most likely to be affected in those with various disorders; the impact of spared and impaired cognitive skills on natural recovery, treatment and management of adult neurologic communication disorders. Spring. Staff.

861 [361] SEMINAR IN LANGUAGE AND LANGUAGE DISORDERS (1–3). May be repeated for credit. Special topics and significant literature in the field of language and language disorders. (On demand.) Staff.

864 [264] LANGUAGE IMPAIRMENTS OF CHILDREN (3). Prerequisite, SPHS 761. Seminar course exploring categorical classifications of young children and the impact of these categories on assessment and intervention. Common topics include autism, visual impairments, fragile X syndrome and Down syndrome. Spring. Crais.

865 [364] DOCTORAL SEMINAR IN GRANT WRITING.

381 SEMINAR IN HEARING SCIENCE (3). May be repeated for credit. Advanced special topics and current research in hearing science. Fall of alternate years. McLean.

870 [370] INDEPENDENT STUDY (1–3). This course gives enrolled audiology graduate students an opportunity to pursue research supervised by one or more faculty members culminating in a document, project or presentation. Fall and spring. Staff.

871 [371] TEACHING AND SUPERVISION (2). Course regarding teaching of skills and supervision of individuals conducting screening programs. Introduction to teaching and development of assessment tools provides a background for the teaching lab associated with this course. Fall. Mundy.

871L [371L] TEACHING AND SUPERVISION LAB (1). Experience developing and delivering training module, instructional module and supervising new trainees. Fall and spring. Mundy

881 [381] SEMINAR IN HEARING SCIENCE (1–3). May be repeated for credit. Advanced special topics and current research in hearing science. (On demand.) Staff.

882 [382] SEMINAR IN SPEECH SCIENCE (1–3). May be repeated for credit. Advanced special topics and current research in speech science. (On demand.) Staff.

897 [307] AUTISM SEMINAR (3). Participants develop knowledge of the major neuropsychological theories of autism and methodological issues in autism research through reading and discussion of literature; participate in developing and presenting autism research projects individually or in groups. Spring of alternate years. Watson.

898 [338] LITERACY. This course provides an overview of literacy development for children birth to eight years old. It will also address the impact of hearing loss on the development of literacy. Spring.

950 [350] RESEARCH, RESOURCES AND TECHNOLOGIES (3). This course explores the use of computers in research and clinical practice for speech-language pathologists and audiologists. Fall. Roush.

993 [393] MASTER'S THESIS (3 or more). Fall, spring and summer. Staff.

994 [394] DISSERTATION (3 or more). Fall, spring and summer.

Department of Statistics and Operations Research

www.stat-or.unc.edu
VIDYADHAR KULKARNI, *Chair*

Professors

Amarjit Budhiraja (2) Probability, Stochastic Analysis, Stochastic Control
Edward Carlstein (3) Nonparametric Statistics, Resampling
Douglas G. Kelly (5) Statistics, Evolutionary Game Theory
Vidyadhar G. Kulkarni (6) Stochastic Models of Queues, Telecommunication Systems, Warranties, Supply Chains
Malcolm Ross Leadbetter (7) Probability, Statistics, Extreme Value Theory
James Stephen Marron, Amos Hawley Distinguished Professor (10) Object Oriented Data Analysis, Visualization, Smoothing
Andrew Nobel (11) Machine Learning, Data Mining, Computational Genomics
J. Scott Provan (14) Network Design, Linear and Combinatorial Optimization, Bio-informatics
Richard L. Smith, Mark L. Reed Distinguished Professor (17) Extreme Value Theory, Environmental Statistics, Spatial Statistics
Jon W. Tolle (18) Optimization

Associate Professors

Jan Hannig (23) Statistics, Fiducial Inference, Stochastic Processes
Chuanshu Ji (4) Financial Econometrics, Computational Materials Science, Monte Carlo Methods
Gabor Pataki (12) Convex Programming, Combinatorial Optimization, Integer Programming
Vladas Pipiras (13) Long-Range Dependence, Self-Similarity, Heavy-Tails, Fractional Calculus, Wavelets, Applications to Telecommunications

Assistant Professors

Nilay Argon (1) Stochastic Models, Manufacturing and Health Care Applications, Simulation
Yufeng Liu, Carolina Center for Genome Sciences (8) Statistical Machine Learning, Data Mining, Bioinformatics, Experimental Designs
Shu Lu (9) Optimization, Variational Inequalities
Haipeng Shen (16) Functional Data Analysis, Time Series, Statistical Modeling of Customer Contact Centers
Zhengyuan Zhu (19) Spatial Statistics, Spatial Sampling Design, Anomaly Detection
Serhan Ziya (20) Stochastic Models, Revenue Management, Service Operations

Lecturer

Charles Dunn, Actuarial Models

Joint Professors

Alan F. Karr, Director, National Institute of Statistical Sciences, Inference for Stochastic Processes, Image Analysis, Engineering Application of Statistics
Michael Kosorok, Biostatistics
Pranab Kumar Sen, Cary C. Boshamer Professor of Biostatistics (15) Nonparametric Methods, Multivariate Analysis, Sequential Analysis
Jayashankar Swaminathan, Benjamin Cone Research Professor, Kenan–Flagler Business School, Supply Chain, Stochastic Models

Adjunct Professors

Kenneth A. Bollen, Comparative Political Structures, Statistics, International Development
George Christakos, Environmental Sciences and Engineering
Mark E. Hartmann, Combinatorial Optimization, Integer Programming, Polyhedral Combinatorics
Harry L. Hurd, Stochastic Processes, Statistical Inference
Eric Renault, Econometrics, Finance
Robert Rodriguez, Statistical Quality Improvement, Statistical Graphics
Randy Tobias, Linear Models, Experimental Design
Harvey M. Wagner (22) Management, Strategic Thinking, Modeling

Professors Emeriti

Charles R. Baker
George S. Fishman
Gopinath Kallianpur, Alumni Distinguished Professor Emeritus
David S. Rubin
Gordon D. Simons
Walter L. Smith
Shaler Stidham Jr.

Graduate Degrees in Statistics and Operations Research

Since the fall semester of 2007, the department has offered the master of science (M.S.) and doctor of philosophy (Ph.D.) in statistics and operations research (STOR). Within each degree, the department runs three programs: statistics (STAT), operations research (OR) and interdisciplinary statistics and operations research (INSTORE).

The Ph.D. degree in STOR is designed for students planning a career in teaching or research. This degree requires at least three (but usually four to five) years of full-time graduate study, predicated upon substantial undergraduate mathematical preparation. Research is a central component in the work of doctoral candidates. The training for research consists of required core course work as well as electives that are designed to bring students up to date in their research field, followed by intensive one-on-one work with a faculty member on a specific dissertation topic. Doctoral students who want to pursue academic careers are provided with ample opportunities to teach introductory undergraduate courses, and they are given extensive training to develop their instructional skills. Doctoral students may also participate in paid internships with local industrial employers to gain experience in a business environment. Their professional skills are further enhanced by working on real-world projects with clients in the department's consulting courses. Several courses provide opportunities for students to give technical presentations and to refine their communication skills.

The M.S. degree in STOR prepares students for jobs in industry and government, and for further graduate study. The philosophy of the M.S. degree is to train students in the basic theory and applications of statistics and operations research. In addition to their course work, M.S. students also complete a master's essay under the supervision of a faculty member. Opportunities for teaching, consulting and internships are also available to M.S. students. Completion of the M.S. degree typically requires two years of full-time graduate study.

Further information on the graduate degree programs can be obtained from the department's home page on the Web at www.stat-or.unc.edu. Information about the OR, STAT or INSTORE programs may also be obtained from the admissions chair of the individual programs, CB# 3260, Smith Building, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599.

Application forms for admission and/or financial aid may be

obtained by writing to either The Graduate School or to the department. An online application is also available through the Web site of The Graduate School at gradschool.unc.edu. Students can indicate on this application form whether they intend to pursue the degree program in OR or STAT or INSTORE. Applicants are required to submit scores for both the Aptitude and Advanced Mathematics portions of the Graduate Record Examination (GRE) in support of their application, and a supplementary sheet providing brief course descriptions (including text title where applicable) or previous undergraduate and graduate courses in mathematics, probability and statistics.

Graduate Program in Operations Research

Operations research is concerned with the process of decision making for the purpose of optimal resource allocation. The spectrum of related activities includes basic research in optimization theory, development of deterministic and stochastic mathematical models as aids for decision making and application of these models to real world problems. The principal steps in modeling consist of analyzing relationships that determine the probable future consequences of decision choices, and then devising appropriate measures of effectiveness in order to evaluate the relative merits of alternative actions. During the past 50 years, operations research has developed as a mathematical science whose methods of analysis are regularly employed in many diverse industries and governmental agencies.

The operations research faculty consists of a resident faculty and an interdisciplinary faculty, with programs of study that offer considerable opportunity for the pursuit of individual student interests. Specialization is possible in deterministic optimization theory (such as nonlinear and integer programming), in stochastic processes and applied probability (such as queueing theory and simulation) or in an approved area of application (such as management science). The M.S. program is intended for the student who is preparing for a career in industry, government or consulting. The Ph.D. program emphasizes theoretical depth and is tailored primarily for the student who is preparing for a career in teaching and/or research. Each program includes study of the mathematical foundations of operations research. In either case, the specific program of study for each student is determined to a large extent on an individual basis through consultations with a faculty advisor to obtain a balance between application and theory. Although it is possible for the well-prepared student to complete the M.S. requirements in three semesters, it more typically requires four semesters. The Ph.D. program, including the dissertation, generally requires four or five years beyond the bachelor's degree. The department offers a minor for Ph.D. students in other departments. The department also offers a course sequence that enables qualified UNC–Chapel Hill undergraduates in the mathematical decision sciences B.S. degree program to fulfill the requirements for the M.S. degree in operations research in one additional academic year (beyond the four years required for the undergraduate degree).

Requirements for Admission to Graduate Study in Operations Research

Applicants must have demonstrated a high level of scholastic ability in their undergraduate studies and must satisfy the entrance requirements of The Graduate School. No restrictions are placed on the undergraduate major for admission to the program. However, to be prepared adequately for study in operations research, an applicant should have a good mathematical background, including courses in advanced calculus, linear or matrix algebra, probability and the knowledge of a computer language. A student admitted with a deficiency in one or more of these topics must make up for it at the beginning of her or his graduate work. If the deficiency is not severe, this can be accomplished without interrupting the normal program.

Degree Requirements for Operations Research

Candidates for degrees in operations research must meet the general requirements of The Graduate School. Course selections for a degree in operations research are taken from the department's offerings and from regular offerings of related departments. In addition to the following courses, selections can be made from the departments of Biostatistics, City and Regional Planning, Computer Science, Epidemiology, Economics, Health Policy and Administration, Information and Library Science, Mathematics, Psychology, the Kenan–Flagler Business School and the Fuqua School of Business in Duke University.

For more details, see stat-or.unc.edu/programs and click on "Operations Research."

Courses for Graduates and Advanced Undergraduates

305 [140] DECISION MAKING USING SPREADSHEET MODELS (3). Prerequisite, STAT 155 or MATH 152. The use of mathematics to describe and analyze large-scale decision problems. Situations involving the allocation of resources, making decisions in a competitive environment and dealing with uncertainty are modeled and solved using suitable software packages. Fall.

372 [161] LONG TERM ACTUARIAL MODELS (3). Prerequisites, MATH 232 or 215, and STAT 155. Probability models for long term insurance and pension systems that involve future contingent payments and failure-time random variables. Introduction to survival distributions and measures of interest and annuities-certain. Fall. Dunn.

415 DETERMINISTIC MODELS IN OPERATIONS RESEARCH (3). Prerequisite, MATH 547. Linear, integer, nonlinear and dynamic programming, classical optimization problems, network theory. Fall. Provan, Tolle.

435 INTRODUCTION TO PROBABILITY (MATH 535) (3). Prerequisite, MATH 233. Introduction to mathematical theory of probability covering random variables; moments; binomial, Poisson, normal and related distributions; generating functions; sums and sequences of random variables; and statistical applications.

445 STOCHASTIC MODELS IN OPERATIONS RESEARCH (3). Prerequisite, BIOS 660 or STOR 435. Introduction to Markov chains, Poisson process, continuous-time Markov chains, renewal theory. Applications to queueing systems inventory, and reliability, with emphasis on systems modeling, design and control. Spring. Kulkarni, Stidham.

455 STATISTICAL METHODS I (3). Prerequisite, STOR 155. Review of basic inference; two-sample comparisons; correlation; introduction to matrices; simple and multiple regression (including significance tests, diagnostics, variable selection); analysis of variance; use of statistical software.

456 STATISTICAL METHODS II (3). Prerequisite, STOR 455. Topics selected from design of experiments, sample surveys, nonparametrics, time-series, multivariate analysis, contingency tables, logistic regression, simulation. Use of statistical software packages.

465 SIMULATION ANALYSIS AND DESIGN (3). Prerequisite, STOR 435. Introduces concepts of random number generation, random variate generation, and discrete event simulation of stochastic systems. Students perform simulation experiments using standard simulation software.

472 SHORT TERM ACTUARIAL MODELS (3). Prerequisite, STOR 435. Short term probability models for potential losses and their applications to both traditional insurance systems and conventional business decisions. Introduction to stochastic process models of solvency requirements. Spring. Dunn.

497 UNDERGRADUATE READING AND RESEARCH IN OPERATIONS RESEARCH (3). Permission of the director of undergraduate studies. This course is intended mainly for students working on honors projects. No one may receive more than three semester hours credit for this course.

515 COMPUTATIONAL MATHEMATICS FOR DECISION SCIENCES (3). Permission of the instructor. Reviews basic mathematical and computational theory required for analyzing models that arise in operations research, management science and other policy sciences. Solution techniques that integrate existing software into student-written computer programs will be emphasized. Fall.

555 MATHEMATICAL STATISTICS (3). Prerequisite, STOR 435 or equivalent. Functions of random samples and their probability distributions, introductory theory of point and interval estimation and hypothesis testing, elementary decision theory.

582 NEURAL NETWORK MODELS FOR THE DECISION AND COGNITIVE SCIENCES (3). Prerequisite, one of MATH 231, PHIL 155, PSYC 210, STOR 155 or 215. The interactions between cognitive science and the decision sciences are explored via neural networks. The history of these networks in neuroscience is reviewed and their adaptation to other fields such as psychology, linguistics and operations research is presented.

Courses for Graduates

612 [210] MODELS IN OPERATIONS RESEARCH (3). Prerequisite, calculus of several variables, linear or matrix algebra. Formulation, solution techniques and sensitivity analysis for optimization problems that can be modeled as linear, integer, network flow and dynamic programs. Use of software packages to solve linear, integer and network problems. Fall. Rubin, Wagner.

614 [211] LINEAR PROGRAMMING (3). Prerequisites, calculus of several variables, linear or matrix algebra. The theory of linear programming, computational methods for solving linear programs and an introduction to nonlinear and integer programming. Basic optimality conditions, convexity, duality, sensitivity analysis, cutting planes and Karush-Kuhn-Tucker conditions. Spring. Provan, Rubin.

634 [154] MEASURE AND INTEGRATION (3). Prerequisite, advanced calculus. Lebesgue and abstract measure and integration, convergence theorems, differentiation. Radon-Nikodym theorem, product measures. Fubini theorems. Lp spaces.

635 [155] PROBABILITY (MATH 635) (3). Prerequisite, STOR 634 or permission of the instructor. Foundations of probability. Basic classical theorems. Modes of probabilistic convergence. Central limit problem. Generating functions, characteristic functions. Conditional probability and expectation.

641 [220] STOCHASTIC MODELS IN OPERATIONS RESEARCH I (3). Prerequisite, STOR 435 or equivalent. Review of probability, conditional probability, expectations, transforms, generating functions, special distributions, functions of random variables. Introduction to stochastic processes. Discrete-time Markov chains. Transient and limiting behavior. First passage times. Fall. Tekin, Ziya.

642 [221] STOCHASTIC MODELS IN OPERATIONS RESEARCH II (3). Prerequisite, STOR 641 or equivalent. Exponential distribution and Poisson process. Birth-death processes, continuous-time Markov chains. Transient and limiting behavior. Applications to elementary queueing theory. Renewal processes and regenerative processes. Spring. Kulkarni, Ziya.

654 [164] STATISTICAL THEORY I (3). Prerequisite, two semesters of advanced calculus. Probability spaces. Random variables, distributions, expectation. Conditioning. Generating functions. Limit theorems: LLN, CLT, Slutzky, delta-method, big-O in probability. Inequalities. Distribution theory: normal, chi-squared, beta, gamma, Cauchy, other multivariate distributions. Distribution theory for linear models.

655 [165] STATISTICAL THEORY II (3). Prerequisite, STOR 654 or equivalent. Point estimation. Hypothesis testing and confidence sets. Contingency tables, nonparametric goodness-of-fit. Linear model optimality theory: BLUE, MVU, MLE. Multivariate tests. Introduction to decision theory and Bayesian inference.

664 [174] APPLIED STATISTICS I (3). Permission of the instructor. Basics of linear models: matrix formulation, least squares, tests. Computing environments: SAS, MATLAB, S+. Visualization: histograms, scatterplots, smoothing, QQ plots. Transformations: log, Box-Cox, etc. Diagnostics and model selection.

665 [175] APPLIED STATISTICS II (3). Prerequisite, STOR 664 or permission of the instructor. ANOVA (including nested and crossed models, multiple comparisons). GLM basics: exponential families, link functions, likelihood, quasi-likelihood, conditional likelihood. Numerical analysis: numerical linear algebra, optimization; GLM diagnostics. Simulation: transformation, rejection, Gibbs sampler.

705 [350] OPERATIONS RESEARCH PRACTICE (3). Prerequisites, OR 614, 641, 762 and permission of the instructor. Gives students an opportunity to work on an actual operations research project from start to finish under the supervision of a faculty member. Intended exclusively for operations research students. Spring.

712 [212] MATHEMATICAL PROGRAMMING I (3). Prerequisites, OR 614 and either OR 515 or MATH 661 or permission of the instructor. Advanced topics from mathematical programming such as geometry of optimization, parametric analysis, finiteness and convergence proofs, and techniques for large-scale and specially structured problems. Spring. Tolle.

713 [213] MATHEMATICAL PROGRAMMING II (3). Prerequisite, OR 712 or permission of the instructor. Advanced theory for nonlinear optimization. Algorithms for unconstrained and constrained problems. Fall. (Alternate years.) Tolle.

722 [214] INTEGER PROGRAMMING (3). Prerequisite, OR 614 or permission of the instructor. Techniques for formulating and solving discrete valued and combinatorial optimization problems. Topics include enumerative and cutting plane methods, Lagrangian relaxation, Benders' decomposition, knapsack problems and matching and covering problems. (Alternate years.) Rubin.

724 [215] NETWORKS (3). Prerequisite, OR 614 or permission of the instructor. Network flow problems and solution algorithms; maximum flow, shortest route, assignment, and minimum cost flow problems; Hungarian and out-of-kilter algorithms; combinatorial and scheduling applications. Spring. Provan.

743 [222] STOCHASTIC MODELS IN OPERATIONS RESEARCH III (3). Prerequisite, OR 642 or equivalent. Intermediate queueing theory, queueing networks. Reliability. Diffusion processes and applications. Markov decision processes (stochastic dynamic programming): finite horizon, infinite horizon, discounted and average-cost criteria. Fall. Tekin, Ziya.

744 [223] QUEUEING NETWORKS (3). Prerequisite, OR 642 or permission of the instructor. Jackson networks; open and closed. Reversibility and quasi-reversibility. Product form networks. Nonproduct form networks. Approximations. Applications to computer performance evaluations and telecommunication networks. (Alternate years.) Tekin, Ziya.

762 [233] DISCRETE EVENT SIMULATION (COMP 762) (3). Prerequisites, STAT 555 and OR 641, or the equivalent and familiarity with computer programming. Introduces students to modeling, programming and statistical concepts applicable to discrete event simulation on digital computers. Emphasizes statistical analysis of simulation output. Students model, program and run simulations. Fall. Tekin, Ziya.

772 [225] INTRODUCTION TO INVENTORY THEORY (3). Prerequisite, permission of the instructor. Introduction to the techniques of constructing and analyzing mathematical models of inventory systems. (On demand.) Wagner, Swaminathan.

790 [389] OPERATIONS RESEARCH AND SYSTEMS ANALYSIS STUDENT SEMINAR (1). Survey of literature in operations research and systems analysis. Spring. Staff.

822 [216] TOPICS IN DISCRETE OPTIMIZATION (COMP 822) (3). Prerequisites, OR 712 and permission of the instructor. Topics may include polynomial algorithms, computational complexity, matching and matroid problems, and the traveling salesman problem. (Alternate years.) Provan.

824 [217] COMPUTATIONAL METHODS IN MATHEMATICAL PROGRAMMING (3). Prerequisites, OR 712 and permission of the instructor. Advanced topics such as interior point methods, parallel algorithms, branch and cut methods, and subgradient optimization. (Alternate years.) Provan.

842 [224] CONTROL OF STOCHASTIC SYSTEMS IN OPERATIONS RESEARCH (3). Prerequisites, OR 641 and OR 642. Review of Markov decision processes. Monotone control policies. Algorithms. Examples: control of admission, service, routing and scheduling in queues and networks of queues. Applications: manufacturing systems, computer/communication systems. (Alternate years.) Tekin, Ziya.

892 [351] SPECIAL TOPICS IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Var.). Prerequisite, permission of the instructor. Fall and spring. Staff.

910 [321] DIRECTED READING IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Var.). Prerequisite, permission of operations research faculty member. Fall and spring. Staff.

992 [392] MASTER'S SUBSTITUTE FOR THESIS (3–21). Prerequisite, permission of the student's advisor. Fall and spring.

993 [393] MASTER'S THESIS (3–6). Prerequisite, permission of the student's advisor. Fall. Staff.

994 [394] DOCTORAL DISSERTATION (3-9). Prerequisite, permission of the student's advisor. Fall and spring. Staff.

Graduate Program in Statistics

The statistics program offers graduate training leading to the master of science (M.S.) and doctor of philosophy (Ph.D.) degrees. The M.S. degree may be included in the doctoral program.

M.S. Program

The statistics M.S. program provides students with rigorous training in one or more areas of statistics and probability. The program is flexible enough to accommodate students with a variety of backgrounds and interests.

The M.S. degree provides a valuable complement to a number of Ph.D. programs in the sciences and social sciences, and enhances the credentials of students in these programs seeking academic or industrial jobs. Over the years, students have completed the statistics M.S. degree concurrently with a Ph.D. in areas such as economics, sociology, psychology, mathematics and physics.

The statistics M.S. degree requires 30 credit hours of course work and the preparation of a master's essay, typically under the direction of a faculty member in the statistics program. Preparation of the master's essay can be counted toward three hours of the 30-credit-hour minimum. Students can choose from a wide variety of courses, including a limited number from outside the department. Upon approval of The Graduate School, at most six credit hours may be transferred from another accredited institution, or from within UNC–Chapel Hill for courses taken before admission to the M.S. program.

Ph.D. Program

The Ph.D. program in statistics provides students with a broad-based course of study in applied statistics, theoretical statistics and probability, as well as numerous advanced topic courses. The breadth and depth of the program has served graduates well in their subsequent careers in academia, industry and government. Doctoral students pursue a wide range of dissertation research, ranging from applied statistics to theoretical probability. Many students are involved in interdisciplinary research that puts them in regular contact with faculty and students from other disciplines.

Basic Requirements for the Statistics Ph.D.

The Ph.D. degree requires at least 45 semester hours of graduate course work and the successful completion of a doctoral dissertation. To meet the course requirements, students typically take 15 three-credit courses. Most courses are selected from among those offered by the statistics program, but approved courses from outside the program can also be counted toward the 45-credit minimum.

The Ph.D. curriculum in statistics places strong emphasis on the mathematical foundations of statistics and probability. A sound mathematical preparation is thus an essential prerequisite for admission to the program. An applicant's mathematical background should include a one-year course in real analysis, at least one semester of matrix algebra and calculus-based courses in probability and statistics.

For more details, see stat-or.unc.edu/programs/statistics/phd.

Applicants for financial aid are considered for assistantships within the department, and as well as for various fellowships and limited service awards provided on a competitive University-wide basis by The Graduate School. Assistants perform academically related duties, such as teaching and assisting instructors. Other awards include merit assistantships, University Graduate and Alumni fellowships, George E. Nicholson Jr. fellowships, Pogue fellowships and Morehead fellowships. Stipends range from $14,700 to $17,000 for the academic year, with tuition included with fellowship awards.

Application for admission and financial aid may be made simultaneously simply by indicating on the admission application form a desire to be considered for financial aid.

More detailed information about the statistics program is available on the department's home page (listed above). Specific inquiries should be addressed to the Director of Graduate Admissions, Statistics Program, CB# 3260, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27599-3260.

Courses for Graduates and Advanced Undergraduates

358 [104] SAMPLE SURVEY METHODOLOGY (BIOS 664) (4). Prerequisite, STAT 355 or equivalent. Fundamental principles and methods associated with survey sampling, giving primary attention to as nonmathematical as possible a treatment of simple random sampling, stratified sampling and cluster sampling. Also, techniques of questionnaire design, the problems of nonresponse and sources of nonsampling errors. Practical experience in the applied aspects of sampling is provided by student participation in the design, execution and analysis of an actual survey. Spring. Kalsbeek.

435 [126] INTRODUCTION TO PROBABILITY (MATH 435) (3). Prerequisite, MATH 233. Introduction to the mathematical theory of probability, covering random variables, moments, binomial, Poisson, normal and related distributions, generating functions, sums and sequences of random variables and statistical applications. Fall and spring. Budhiraja, Kelly, Nobel.

555 [127] MATHEMATICAL STATISTICS (3). Prerequisite, STAT 435 or equivalent. Functions of random samples and their probability distributions; introductory theory of point and interval estimation, and of hypothesis testing; elementary decision theory. Spring. Carlstein, Kelly, Simons.

634 [154] MEASURE AND INTEGRATION (3). Prerequisite, advanced calculus. Lebesgue and abstract measure and integration, convergence theorems, differentiation, Radon-Nikodym theorem, product measures, Fubini theorems, Lp spaces. Fall. Budhiraja, Leadbetter, Pipiras.

635 [155] PROBABILITY (MATH 635) (3). Prerequisite, STAT 634 or permission of the instructor. Foundations of probability. Basic classical theorems. Modes of probabilistic convergence. Central limit problem. Generating functions, characteristic functions. Conditional probability and expectation. Spring. Kelly, Leadbetter, Nobel.

654 [164] STATISTICAL THEORY I (3). Prerequisite, advanced calculus. Fundamentals of probability and distribution theory necessary for statistical inference. Fall. Kelly, Nobel, Simons.

655 [165] STATISTICAL THEORY II (3). Prerequisite, STAT 654. Fundamentals of statistical inference: point estimation, hypothesis testing and confidence sets, introduction to nonparametric statistics, introduction to decision theory and Bayesian inference. Spring. Simons, Ji, Marron.

664 [174] APPLIED STATISTICS I (3). Prerequisite, STAT 555 or equivalent. Introduction to linear models and multiple regression; introduction to statistical computing; statistical data analysis and visualization. Fall. Smith, Marron.

665 [175] APPLIED STATISTICS II (3). Prerequisite, STAT 664. Analysis of variance, generalized linear models, introduction to simulation, topics in numerical analysis. Spring. Smith, Marron, Zhu.

734 [184] STOCHASTIC PROCESSES (3). Prerequisite, STAT 435 or equivalent. Discrete and continuous parameter Markov chains, Brownian motion, stationary processes. Fall, alternate years. Leadbetter, Nobel, Ji.

754 [185] TIME SERIES AND MULTIVARIATE ANALYSIS (3). Prerequisites, STAT 435 and 555 or equivalents. Introduction to time series: exploratory analysis, time-domain analysis and ARMA models, Fourier analysis, state space analysis. Introduction to multivariate analysis: principal components, canonical correlation, classification and clustering, dimension reduction. Spring, alternate years. Leadbetter, Marron, Smith.

756 [194] DESIGN AND ROBUSTNESS (3). Prerequisite, STAT 555 or equivalent. Introduction to experimental design, including classical designs, industrial designs, optimality and sequential designs. Introduction to robust statistical methods; bootstrap, cross-validation, and resampling. Fall, alternate years. Marron.

757 [195] BAYESIAN STATISTICS AND GENERALIZED LINEAR MODELS (3). Prerequisite, STAT 555 or equivalent. Bayes factors, empirical Bayes theory, applications of generalized linear models. Spring. Staff.

765 [190] STATISTICAL CONSULTING (3). Application of statistics to real problems presented by researchers from the University and local companies and institutes. (Taught over two semesters.) Fall and spring. Marron, Smith.

Courses for Graduates

755 [220] ESTIMATION, HYPOTHESIS TESTING AND STATISTICAL DECISION (3). Prerequisites, STAT 635 and 655 or equivalents. Bayes procedures for estimation and testing. Minimax procedures. Unbiased estimators. Unbiased tests and similar tests. Invariant procedures. Sufficient statistics. Confidence sets. Large sample theory. Statistical decision theory. Staff.

763 [205] STATISTICAL QUALITY IMPROVEMENT (3). Prerequisites, STAT 655, 664 or equivalent. Methods for quality improvement through process control, graphical methods, designed experimentation. Shewhart charts, cusum schemes, methods for autocorrelated multivariate process data, process capability analysis, factorial and response surface designs, attribute sampling. Rodriguez.

831 [231] ADVANCED PROBABILITY (3). Prerequisites, STAT 634 and 635 or equivalents. Advanced theoretic course, covering topics selected from weak convergence theory, central limit theorems, laws of large numbers, stable laws, infinitely divisible laws, random walks, martingales. Staff.

832 [232] STOCHASTIC PROCESSES (3). Prerequisites, STAT 634 and 635 or equivalents. Advanced theoretic course including topics selected from foundations of stochastic processes, renewal processes, Markov processes, martingales, point processes. Staff.

833 [233] TIME SERIES ANALYSIS (3). Prerequisites, STAT 634 and 635 or equivalents. Analysis of time series data by means of particular models such as autoregressive and moving average schemes. Spectral theory for stationary processes and associated methods for inference. Stationarity testing. Leadbetter.

834 [234] EXTREME VALUE THEORY (3). Prerequisites, STAT 635 and 654 or equivalents. Classical asymptotic distributional theory for maxima and order statistics from i.i.d. sequences, including extremal types theorem, domains of attraction, Poisson properties of high level exceedances. Stationary stochastic sequences and continuous time processes. Leadbetter.

835 [235] POINT PROCESSES (3). Prerequisite, STAT 635 or equivalent. Random measures and point processes on general spaces, Poisson and related processes, regularity, compounding. Point processes on the real line stationarity, Palm distributions, Palm-Khintchine formulae. Convergence and related topics. Leadbetter.

836 [236] STOCHASTIC ANALYSIS (3). Prerequisites, STAT 634 and 635 or equivalents, or permission of the instructor. Advanced course covering topics selected from semimartingale theory, stochastic integrals, homogeneous chaos expansions, stochastic differential equations, Malliavin calculus, infinite dimensional processes, functional central limit theorems, Feynman-Kac formula, Feynman integral. Applications to filtering theory, infinite particle systems, quantum mechanics and stochastic models in neurophysiology. Pipiras, Budhhiraja.

851 [221] SEQUENTIAL ANALYSIS (3). Prerequisites, STAT 635 and 655 or equivalents. Hypothesis testing and estimation when sample size depends on the observations. Sequential probability ratio tests. Sequential design of experiments. Optimal stopping. Stochastic approximation. Staff.

852 [222] NONPARAMETRIC INFERENCE: RANK-BASED METHODS (3). Prerequisites, STAT 635 and 655. Estimation and testing when the functional form of the population distribution is unknown. Rank, sign and permutation tests. Optimum nonparametric tests and estimators including simple multivariate problems. Sen.

853 [223] NONPARAMETRIC INFERENCE: SMOOTHING METHODS (3). Prerequisites, STAT 635 and 655. Density and regression estimation when no parametric model is assumed. Kernel, spline and orthogonal series methods. Emphasis on analysis of the smoothing problem and data based smoothing parameter selectors. Marron.

854 [224] STATISTICAL LARGE SAMPLE THEORY (3). Prerequisites, STAT 635 and 655 or equivalents. Asymptotically efficient estimators; maximum likelihood estimators. Asymptotically optimal tests; likelihood ratio tests. Staff.

855 [225] SUBSAMPLING TECHNIQUES (3). Prerequisite, STAT 655 or equivalent. Basic subsampling concepts: replicates, empirical c.d.f., U-statistics. Subsampling for i.i.d. data: jackknife, typical-values, bootstrap. Subsampling for dependent or nonidentically distributed data: blockwise and other methods. Carlstein.

856 [260] MULTIVARIATE ANALYSIS (3). Prerequisites, STAT 655 and Introduction to Matrix Theory, Multivariate Normal Distributions. Related distributions. Tests and confidence intervals. Multivariate analysis of variance, covariance and regression. Association between subsets of a multivariate normal set. Theory of discriminant, canonical and factor analysis. Fall. Staff.

857 [262] NONPARAMETRIC MULTIVARIATE ANALYSIS (3). Prerequisite, STAT 852. Nonparametric MANOVA. Large sample properties of the tests and estimates. Robust procedures in general linear models, including the growth curves. Nonparametric classification problems. Sen.

Advanced Graduate-Level Courses*

890, 891 [321, 322] SPECIAL PROBLEMS (1–21). Prerequisite, permission of the instructor.

930, 950 [331, 332] ADVANCED RESEARCH (0.5–21). Prerequisite, permission of the instructor.

940, 960 [310, 311] SEMINAR IN THEORETICAL STATISTICS (0.5–21). Prerequisite, STAT 655.

993 [392] MASTER'S PAPER (3–6). Prerequisite, permission of the student's advisor. Fall and spring. Staff.

994 [394] DOCTORAL DISSERTATION (3–9). Prerequisite, permission of the student's advisor. Fall and spring. Staff.

*These courses are new or have been offered in recent years. Some of these courses will be offered on a regular basis with a course number after approval from The Graduate School.

PATTERN RECOGNITION. Nobel.

DESIGN AND CODING. Staff.

TOPICS IN COMPUTATIONAL FINANCE. Ji.

STOCHASTIC FINANCE. Staff.

ENVIRONMENTAL STATISTICS. Smith.

DATA-ANALYTIC MODELINGS AND THEIR APPLICATIONS. Staff.

GIBBS RANDOM FIELDS AND CERTAIN STATISTICAL APPLICATIONS. Ji.

TOPICS IN WEAK CONVERGENCE, MARKOV PROCESSES, AND STOCHASTIC DIFFERENTIAL EQUATIONS. Staff.

FUNCTIONAL DATA ANALYSIS. Marron.

INDUSTRIAL EXPERIMENTATION AND CLINICAL TRIALS: DESIGN AND STATISTICAL ANALYSIS. Staff.

Statistics Courses for Students from Other Disciplines

A number of STOR courses in probability and statistics are of potential interest to students in other disciplines. At the advanced undergraduate/beginning graduate level, STOR 455 and 456 provide an introduction to applied statistics, including regression, analysis of variance and time series. STOR 435 and 555 provide introductions to probability theory and mathematical statistics, respectively, at a postcalculus level.

The three graduate course sequences (664, 665), (654, 655) and (634, 635) provide comprehensive introductions to modern applied statistics, theoretical statistics and probability theory, respectively, at a more mathematical level. In each case it is possible to take only the first course in a sequence. Concerning mathematical prerequisites, 664 and 665 require a background in linear algebra and matrix theory, while the remaining courses require a solid background in real-analysis.

INSTORE Program

A new Ph.D. and M.S. program entitled "Interdisciplinary Statistics and Operations Research" (INSTORE) was established in the fall semester of 2007. This program is designed for students who seek a more flexible program than the two traditional programs (in statistics and in operations research separately), which continue to run alongside the new INSTORE program. The INSTORE program is suitable for students pursuing an interdisciplinary research agenda who want to combine elements from the traditional statistics and operations research programs or who want to develop significant expertise in the applications of statistics and operations research to some outside area such as genetics, finance, social science or environmental science. The structure of the INSTORE program allows a great deal of flexibility for adaptively combining statistics, operations research and external fields of application. However, there are certain specific tracks that contain suggested sequences of courses allowing students to focus on certain areas of study. For example, there is a track in Applied Statistics and Optimization, and further tracks are planned in Econometrics and Financial Mathematics and in Bioinformatics. A mechanism also exists for students to propose their own track (subject to approval by the department's faculty). For detailed descriptions of the content and requirements of the INSTORE program go to stat-or.unc.edu/programs and click on "Interdisciplinary Statistics and Operations Research."

Curriculum in Toxicology

www.med.unc.edu/toxicology
JAMES A. SWENBERG, *Director*

Professors

Louise M. Ball, Metabolism and Genotoxicity of Environmental Xenobiotics
Thomas W. Bouldin, Neuropathology, Ocular Pathology and Neurotoxicology
Kim R. Brouwer, Pharmacokinetics, Hepatic Transport, Hepatobiliary Disposition, Biliary Excretion, Hepatotoxicity
Stephen G. Chaney, DNA Repair and Platinum Anticancer Drugs
Frank C. Church, Thrombosis and Hemostasis, Breast and Prostate Carcinogenesis, Macromolecular Structure-Function
Rosalind A. Coleman, Diabetes, Obesity, Regulation of Triacylglycerol Synthesis, Glycogen Storage Disease
William B. Coleman, Hepatocarcinogenesis, Tumor Suppressor Genes, Biology of Liver Stem Cells, Cancer Epigenetics
Marila Cordeiro-Stone, DNA Repair and Replication in Human Cells, Mechanisms of Response to DNA Damage
Fulton T. Crews, Neurodegeneration and Chronic Drug-Induced Changes in Brain Signaling Pathways
Channing J. Der, Ras Protein Superfamily, Signal Transduction and Oncogenesis
Marilie D. Gammon, Cancer Epidemiology
Avram Gold, Structure-Reactivity Relationships in Metabolism and Mutagenicity of Polycyclic Aromatic Hydrocarbons
Milan J. Hazucha, Health Effects of Air Pollutants, Human Studies, Mechanisms of Response
David J. Holbrook Jr., Biochemical Toxicology, Xenobiotic Metabolism
David G. Kaufman, DNA Replication, Chemical Carcinogenesis
William K. Kaufmann, DNA Metabolism in Radiation and Chemical Carcinogenesis
Jean M. Lauder, Developmental Neurobiology, Developmental Biology, Neurotoxicology
Nobuyo N. Maeda, Animal Models of Hyperlipidemia, Atherosclerosis and Cardiomyopathy
Terry Magnuson, Mammalian Genetics, Genomics and Development
Richard B. Mailman, Neurotoxicology and Neuropharmacology of the Nervous System
Patricia F. Maness, Axon Guidance and Signal Transduction in Nervous System Development
Robert C. Millikan, Cancer, Genetic and Molecular Epidemiology
A. Leslie Morrow, Neurotoxicology and Excitotoxicity of Alcohol
Leena A. Nylander-French, Development of Methods to Monitor and Assess Dermal Exposure to Chemical Carcinogens and Contact Sensitizers
Andrew F. Olshan, Molecular Epidemiology of Cancer, Reproductive and Developmental Outcomes
Winston Campbell (Cam) Patterson, Vascular Biology, Angiogenesis, Protein Folding and Degradation
David B. Peden, Translational and Clinical Research in Environmental Lung Disease
Gary M. Pollack, Pharmacokinetics and Pharmacodynamics of Therapeutic and Toxic Agents
Daniel Pomp, Genetic Architecture of Complex Traits, Gene-Environment Interactions, Polygenic Mouse Models, Obesity
Bryan L. Roth, Cardiopulmonary Toxicology, Research Translation, Animal Models of Human Diseases, Biomarkers
Marschall S. Runge, Cardiopulmonary Toxicology, Vascular Biology, Thrombosis and Atherosclerosis, Role of Reactive Oxygen Species
R. Jude Samulski, Development of Efficient Viral Vectors for Gene Delivery into Eukaryotic Genes
Aziz Sancar, DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes, Human Blue-Light Photoreceptor
Kathleen K. Sulik, Developmental Toxicology, Embryology

James A. Swenberg, Carcinogenesis, DNA and Protein Adducts, Cell Proliferation, Risk Assessment
Alexander Tropsha, Molecular Modeling, Computer-Assisted Drug Design, Molecular Dynamics of Proteins, Protein Folding
Terry A. Van Dyke, Genetically Engineered Mice, Cancer Models, Roles of p53, pRb and PTEN
Paul B. Watkins, Mechanistic Toxicology, Hepatotoxicology, Research Translation, Biomarkers
Bernard E. Weissman, Chromatin Remodeling and Epigenetic Alterations in Human Cancer
Elizabeth M. Wilson, Environmental Androgens and Antiandrogens, Androgen Receptor Regulation of Prostate Cancer
Steven H. Zeisel, Nutrients and Brain Development, Choline and Carcinogenesis, Isoflavones and Cancer, Antioxidants and Apoptosis

Associate Professors

Lisa A. Carey, Breast Carcinogenesis, Research Translation, Animal Models of Human Diseases, Biomarkers
Mohanish P. Deshmukh, Molecular Mechanisms of Apoptosis in Neurons and Other Postmitotic Cells
Lee M. Graves, Protein Kinases and Cell Signaling, Regulation of Cell Metabolism and Toxicity
Ilona Jaspers, Cellular Mechanisms of Air Pollutant Toxicity
Jeffrey M. Macdonald, Metabolomics and Fluxomics Using NMR Spectroscopy and Imaging, Tissue Engineering
Charles M. Perou, Characterization and Classification of Human Breast Tumors into Subtypes of Biological and Clinical Importance
Dale A. Ramsden, V(D)J Recombination and DNA Double Strand Break Repair
Scott H. Randell, Identification of Airway Epithelial Stem Cells, Airway Innate Immunity, Pathophysiology of Lung Diseases
Robert A. Roubey, Developmental and Immunotoxicology, Animal Models of Human Diseases, Biomarkers
Ivan I. Rusyn, Environmental Genomics
Philip C. Smith, Toxicokinetics and Xenobiotic Metabolism, Peptide Analysis and Disposition
Nancy E. Thomas, Molecular Carcinogenesis, Environmental Toxicology, Molecular Epidemiology, Research Translation, Biomarkers
David W. Threadgill, Mammalian Genetics, Systems Genetics, Toxicogenomics, Gene-Environment Interactions, Cancer Susceptibility

Assistant Professors

David Neil Hayes, Lung Carcinogenesis, Research Translation, Biomarkers, Computational Toxicology
Mary F. Paine, Drug Xenobiotic Metabolism, Pharmacokinetics, Drug Xenobiotic Interactions
W. Kimryn Rathmell, Genetics of Renal Cell Carcinoma
Norman E. Sharpless, Tumor Suppressor Genes, Genetics of Cancer and Aging

Research Associate Professor

Miroslav Styblo, Metabolism and Biological Effects of Essential and Toxic Metals and Metalloids

Adjunct Professors

Melvin E. Andersen, Pharmacokinetic and Pharmacodynamic Modeling of Environmental Compounds
Trevor Archer, Molecular Carcinogenesis, Chromatin Structure, Control of Gene Transcription, Epigenetics
Linda S. Birnbaum, Chemical Disposition of Xenobiotics, Mechanistic Toxicology, Dose-Response and Risk Assessment
John A. Cidlowski, Apoptosis, Steroids, Glucocorticoid Receptors, Hormone Action, Nucleases, Gene Regulation
Daniel L. Costa, Cardiopulmonary and Inhalation Toxicology, Health Effects of Air Pollutants
Robert B. Devlin, Pulmonary Toxicology, Molecular Biology
David C. Dorman, Experimental Neurotoxicology, Nasal Toxicology, Pharmacokinetics
Steven R. Kleeberger, Genetic Determinants of Environmental Lung Disease
Ronald P. Mason, Free-Radical Intermediates in the Metabolism of Toxic Chemicals
Stephanie Padilla, Behavioral Toxicology and Neurotoxicology
John M. Rogers, Developmental Toxicology, Teratology, Developmental Biology, Embryology, Nutrition
MaryJane K. Selgrade, Immunotoxicology
Robert C. Sills, Molecular Pathology
Hugh A. Tilson Jr., Behavioral Toxicology, Developmental Neurotoxicology
Michael D. Waters, Mutagenesis and Carcinogenesis, Toxicogenomics

Adjunct Associate Professors

James W. Allen, Genetic Toxicology, Toxicogenomics and Epigenetic Mechanisms in Chemical Carcinogenesis
Kevin M. Crofton, Understanding the Consequences of Endocrine Disruption on Neurodevelopment
Michael DeVito, Development of Models for Cumulative Risk to Endocrine Disruptors
David Díaz-Sánchez, Translation Research, Environmental Impacts on Human Health, Immunology, Genetic susceptibility, Epigenetics
Suzanne Fenton, Environmental Effects on Mammary Gland Development and Function
M. Ian Gilmour, Experimental Toxicology
G. Jean Harry, Developmental Neurotoxicology, Molecular Neuro/Immunotoxicology
E. Sidney Hunter, Mechanisms of Developmental Toxicity, Oxidative Stress, Embryonic Stem Cells in Developmental Toxicity
Urmila P. Kodavanti, Cardiovascular Diseases and Susceptibility, Air Pollutants, Cardiopulmonary Interactions, Molecular mechanisms, Genetic and Environmental Factors
Edward L. LeCluyse, Cellular/Molecular Mechanisms Regulating Liver Cytochrome P450 Enzymes Expression
Michael C. Madden, Air Pollution Toxicology, Lung Oxidative Stress and Inflammation
Ram (T. V.) Ramabhadran, Neurotoxicological Effects of Environmental Pollutants, Cellular Stress Pathways
James M. Samet, Inflammatory Responses to Pollutant Inhalation, Cytokines, Eicosanoids
Kenneth R. Tindall, Molecular Mutagenesis, Somatic Cell Mutation, Role of Mutagenesis in Carcinogenesis
Gregory S. Travlos, Hematology and Clinical Chemistry
Nigel Walker, Risk Assessment, Receptor-Mediated Toxicants, Environmental Contaminants and Mechanisms of Carcinogenesis
Douglas C. Wolf, Chemical Carcinogenesis

Adjunct Assistant Professors

Ronald E. Cannon, Cancer Biology, Transgenic Mouse Models
Michael G. Narotsky, Developmental Toxicology, Pregnancy Maintenance and Parturition

The Curriculum

The Curriculum in Toxicology administers a degree program leading to the award of the Ph.D. in toxicology. The curriculum is an interdisciplinary program, and its faculty is drawn from various administrative units of the Schools of Medicine, Pharmacy and Public Health. The training faculty also includes scientists at government laboratories on campus or in the Research Triangle Park (e.g., EPA, NIEHS). The research interests of the faculty include most areas of toxicology, with particular emphasis on understanding the links between the environment and health risks, the mode of action of toxicants and disease pathogenesis and how emerging knowledge could be translated into

prevention strategies, new therapeutic interventions and an improved scientific basis for risk assessment. The main areas of research concentration are molecular carcinogenesis, mechanistic toxicology, neurotoxicology, cardiopulmonary toxicology, hepatic toxicology, computational toxicology, developmental toxicology, immunotoxicology, drug and xenobiotic metabolism and ethanol toxicology. Multidisciplinary efforts are directed at environmental toxicology, systems biology, animal models of human diseases, translational research and biomarkers. The faculty generally does not conduct research in the areas of aquatic toxicology, forensic toxicology, the ecological aspects of toxicology or studies in invertebrate systems. The research activities of the Curriculum in Toxicology are conducted in the laboratory facilities assigned to each faculty member by a participating administrative unit.

Applications

Students with interest in the Ph.D. degree in toxicology must apply for Graduate School admission through the Biological and Biomedical Sciences Program. Applications are considered from students who have received or expect to receive a B.S./B.A. or an M.S. degree in a scientific discipline. A desirable background for predoctoral studies in toxicology includes courses in biological sciences (including histology and animal physiology), in chemistry (including analytical and organic) and mathematics through calculus, although all of these are not absolutely essential. A strong course in general biochemistry accelerates the student's progress. Applicants are evaluated on the basis of undergraduate (and graduate) academic performance, Graduate Record Examination (GRE) scores and letters of recommendation. Students are accepted on the basis of their achievement and potential. Prior research experience is strongly considered in the assessment of qualifications for admission.

Requirements for the Ph.D. Degree

The selection of graduate courses is influenced by the student's prior academic background. The academic courses that we consider appropriate for graduate training in toxicology include biochemistry, biostatistics, pathology, pharmacology, toxicology and two or three elective courses in the specific areas of the doctoral research. In addition, each predoctoral student is expected to participate in a minimum of 12 credit hours of nondidactic training activities; i.e., two semesters of laboratory experience (research rotations) prior to selection of the doctoral research project and four semesters of student-centered seminars. Attendance and participation in the Curriculum in Toxicology seminar series is also required.

A major requirement for the Ph.D. degree is a doctoral dissertation based on the student's independent laboratory research. Written and oral examinations are required in the fields of general toxicology and the major research interest.

Financial Aid

The curriculum seeks to fund predoctoral students each year. All applicants are considered for financial aid awards.

Courses for Graduates and Advanced Undergraduates

423 [123] DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (CBIO 423) (2). Emphasis is placed on topics of current research interest relative to the genesis of environmentally caused and genetically based birth defects. One two-hour session per week . Spring. (2009 and alternate years.) Cell and Developmental Biology and Toxicology faculty: Sulik, Rogers, and Hunter (course directors).

442 [142] BIOCHEMICAL AND MOLECULAR TOXICOLOGY (BIOC 442, ENVR 442) (3). Prerequisites, any combination of two courses in biochemistry, molecular biology, cell biology or cell physiology (or permission of the course director). Development of a comprehensive understanding of biochemical and molecular actions of environmental chemicals and toxicants, and proper application of novel laboratory techniques for hypothesis-driven mechanistic research. Three lecture hours per week. Spring. Toxicology faculty: Rusyn (course director).

Courses for Graduates

702 [202] PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (PHCO 702) (3). Prerequisite, PHCO 701 or approval of the instructor. Introduces the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. Three lecture hours per week. Spring. Pharmacology faculty: Johnson (course director).

707 [207] ADVANCED TOXICOLOGY (PHCO 707, ENVR 707) (3). Prerequisite, PHCO 702 or permission of the course director. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on inhalation toxicology, developmental toxicology, immunotoxicology, radiation toxicology, renal toxicology and neurotoxicology. Three lecture hours per week. Fall. Toxicology faculty: Swenberg (course director).

715 [215] INTRODUCTION TO TOXICOLOGICAL RESEARCH (4). Introductory laboratory experience from research projects of limited scope to acquaint students with the experimental approaches, techniques and equipment of current research in toxicology. May be repeated. Twelve laboratory hours per week. Fall, spring and summer. Toxicology faculty: Nylander-French (course director).

720 [220] TOXICOLOGY SEMINAR I (1). Seminar series to introduce recent advances, methodology and terminology in toxicology. One hour per week. Fall and spring. Toxicology faculty: Padilla (course director).

721 [221] TOXICOLOGY SEMINAR II (1). Student-conducted presentations and discussions of recent advances in toxicology; emphasis on critical evaluation of published investigations and on organization and oral delivery of presentations. May be repeated up to three times. One hour per week. Fall and spring. Toxicology faculty: Padilla (course director).

722 [222] TOXICOLOGY SEMINAR III (ENVR 722) (1). Presentations by outside invited speakers, local faculty, advanced graduate students and postdoctoral trainees. Topics will cover all areas of research in toxicology. One hour per week. Fall and spring. Toxicology faculty: Rusyn (course director).

750 [250] APPLIED BIOSTATISTICS (PATH 750, PHCO 750, CBIO 750) (1). Data analysis for biomedical scientists. This largely self-study course deals with basic statistical and quantitative methods for the analysis and interpretation of biomedical data. This course is required for PHCO/TOXC/PATH graduate students. Permission of the instructor is required for other students. Fall. Graves (course director).

760 [260] TOXICOKINETICS (3). A quantitative examination of the time course of absorption, distribution, metabolism, excretion and biologic effects of agents of toxicologic interest. Three lecture hours per week. Fall. (2009 and alternate years.) Brouwer, Paine (course codirectors).

792 [292] SEMINAR IN CARCINOGENESIS (PATH 792) (2). Prerequisite, permission of the course director. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. Two seminar hours per week. Spring. Pathology faculty: Coleman (course director).

901 [301] RESEARCH IN TOXICOLOGY (Var.). May be repeated for credit. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

993 [393] MASTER'S THESIS (Var.). May be repeated. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

994 [394] DOCTORAL DISSERTATION (Var.). May be repeated. Hours and credits to be arranged. Fall, spring and summer. Toxicology faculty.

Appendix

Alcoholic Beverages

Possession and use of alcoholic beverages is substantially regulated by federal, state and local laws and ordinances. Within this legal framework, the University's Policy on Student Possession and Consumption of Alcoholic Beverages in Facilities of the University of North Carolina at Chapel Hill sets out the conditions under which alcoholic beverages may be used on University property.

According to North Carolina law:

A. Generally persons 21 or older may purchase or consume alcoholic beverages and may possess alcoholic beverages at their homes or temporary residences.
B. It is against the law for any person under 21 to purchase or possess any alcoholic beverage.
C. It is against the law for anyone to sell or give any alcoholic beverage to a person under 21 or to aid or abet such a person in selling, purchasing or possessing any alcoholic beverage.
D. No alcoholic beverages may be sold by any person, organization or corporation on a college campus except by a hotel or nonprofit alumni organization with a mixed beverages or special occasion permit, by a performing arts center with permits for malt beverages and unfortified wine, or by a University golf course open to the public that has a permit for malt beverages. Both direct and indirect sales are unlawful.

According to Chapel Hill ordinance, it is against the law for anyone to possess any open alcoholic beverage on streets, sidewalks, alleys or any other property owned or controlled by the Town of Chapel Hill.

In addition to following the law, the University's Policy on Student Possession and Consumption of Alcoholic Beverages in Facilities of the University of North Carolina at Chapel Hill sets out special rules about alcohol for students and student organizations. The Office of the Dean of Students will provide copies of the policy and assistance in understanding its full implications. The text of the policy can be accessed on the Web at www.unc.edu/campus/policies/studentalcohol.html.

Under the policy:

A. Alcohol may not be served or consumed in any University building or open space except as provided in the University's Guidelines for Serving Alcohol at University-Sponsored Events. The guidelines are available on the Web at www.unc.edu/campus/policies/alcohol.html.
B. Alcohol may not be possessed or consumed at any campus athletic event or at any performance on campus, and alcohol may not be consumed at any outdoor campus location.
C. Common source containers of alcohol (e.g., kegs) are not permitted on campus.
D. Students and their guests aged 21 and older may possess and consume alcoholic beverages in individual campus residence hall rooms or apartments on campus, but not in the common areas of a campus residence hall.
E. No Student Activity Fees or other University-collected fees may be used to purchase alcohol.
F. No other funds of an officially recognized student group deposited or administered through the Student Activities Fund Office may be used to purchase alcohol.
G. Student groups are not prohibited from having events off campus at which individual group members aged 21 or older bring or buy their own alcoholic beverages.

Students who violate the policy face mandatory alcohol education, housing sanctions (for violations arising in University Housing), and sanctions including written reprimand, restitution, counseling/referral, and/or educational/community service activities. Student groups who violate the policy face sanctions of written reprimand, restitution, mandatory educational programs or community service and/or loss of University recognition. Behavior that violates the Code of Student Conduct, state or federal laws may also be referred to the Student Judicial System, the Emergency Evaluation and Action Committee, and/or state and federal authorities.

Emergency Disciplinary Action

In order to protect University property or members of the University community or to prevent disruption of the academic process, occasionally the University must take emergency action to separate a student from the University. The Chancellor has, therefore, created the Emergency Evaluation and Action Committee. With respect to disciplinary matters, the committee acts only when no other administrative solution, including action by the Student Judicial System, is in its judgment adequate to deal effectively with the situation.

Students whose cases may require action by the committee fall into five categories:

A. Applicants for admission or readmission to the University who have been convicted of a crime involving assaultive or felonious behavior, who have a record of violent behavior, or who have a record of academic dishonesty or disciplinary rule violations elsewhere;
B. Students whose behavior, on or off campus, is such that their presence in the University, in the judgment of the committee, poses a serious threat of disruption of the academic process or a continuing danger to other members of the University community, or University property;
C. Students or applicants who have been arrested and charged with a serious crime of a violent or dangerous nature, or a serious crime that involved placing another person in fear of imminent physical injury or danger, where, in the judgment of the committee, if the students are found guilty, their presence in the University would pose a serious threat of disruption of the academic process or a continuing danger to other members of the University community, or University property;
D. Students, charged by the University with a violation of policies concerning illegal drugs, whose continued presence within the

University community would, if the charges are true, constitute a clear and immediate danger to the health or welfare of other members of the University community.

E. Students whose behavior on or off campus is such that, in the judgment of the committee, they pose a danger to themselves.

Full information on the committee and its procedures is available from the Division of Student Affairs through the office of the Dean of Students. The text of the committee's policy and procedures is on the Web at www.unc.edu/policies/tapedec98.pdf.

Equity in Athletics Disclosure Act

Information compiled under the federal Equity in Athletics Disclosure Act is available on request from the Office of the Director of Athletics.

Expulsion

A student who has been expelled from an institution in the University of North Carolina system may not be admitted to another UNC-system school unless the institution that originally expelled the student rescinds that expulsion.

Family Educational Rights and Privacy Act

As a general rule, under the federal Family Educational Rights and Privacy Act (FERPA), personally identifiable information may not be released from a student's education records without his or her prior written consent. Exceptions to this rule are set out in the FERPA regulations and the FERPA policy of the University of North Carolina at Chapel Hill. A few of the exceptions are listed below; others may be found in the University's FERPA policy and accompanying federal regulations.

The University will disclose personally identifiable information from a student's education records to officials of another school or school system in which the student seeks or intends to enroll and to officials of another school or school system in which a currently enrolled UNC-Chapel Hill student is contemporaneously enrolled.

If the University takes disciplinary action against a student for conduct that posed a significant risk to the safety or well-being of the student, other students, or members of the University community, the University may disclose information about that disciplinary action to officials of other schools who have a legitimate educational interest in the student's behavior.

If the University, pursuant to campus disciplinary procedures, finds that a student has committed a violation of the Honor Code that constitutes a crime of violence or a nonforcible sex offense, the University will, upon request, disclose the name of the student, the violation committed, and any disciplinary sanction imposed on the student.

The University will release information from a student's education records to UNC-Chapel Hill school officials (including teachers, officials, and employees) who have a legitimate educational interest in the information. A school official has a "legitimate educational interest" if it is in the educational interest of the student in question for the official to have the information, or if it is necessary or desirable for the official to obtain the information in order to carry out his or her official duties or to implement the policies of the University of North Carolina.

The University makes public certain information that has been designated as "directory information" unless the student has notified the Office of the University Registrar to restrict the release of this information. The University considers the following to be "directory information": the student's name; address (local and grade/billing addresses); student email address; telephone listing (local and grade/billing telephone numbers); date and place of birth; county, state, and/or United States territory from which the student entered the University; major field of study, class (first year, senior, etc.); enrollment status (full-time, half-time, or part-time); Person ID Number (PID); anticipated graduation date; participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance; degrees and awards received; and the most recent previous educational agency or institution attended by the student. The University also publishes the Campus Directory annually, and some professional and graduate student groups publish directories of students in their departments or schools.

Students who wish to restrict how address information is printed in the Campus Directory, or who wish to have some or all directory information restricted, or to remove some or all student data from the Web, must either set the appropriate access online via the Web at Student Central (studentcentral.unc.edu), notify the Office of the University Registrar in writing, or go to 3100 Student and Academic Services Building North to complete the appropriate form. The Office of the University Registrar will accept requests and update the student's listing in the online Campus Directory at any time; however, to affect the listing in the printed Campus Directory students must submit the request to the Office of the University Registrar by the last day to register in the fall semester. For more information consult the Office of the University Registrar.

Receipt of an approved master's thesis or doctoral dissertation in The Graduate School is tantamount to publication, and the thesis or dissertation will be available to the public. Honors theses are also made available to the public through the University Library. Other student papers may be put in campus libraries or otherwise made public in accordance with individual course or program requirements.

The Family Educational Rights and Privacy Act also gives a student the right to inspect his or her education records and to request amendment of those records if they are inaccurate, misleading, or otherwise in violation of the student's privacy rights. To inspect his or her education records, a student must file a written request with the individual who has custody of the records that the student wishes to inspect. To request amendment of his or her records, a student first discusses the matter informally with the records custodian, and if the custodian does not agree to amend the records, he or she will inform the student of applicable appeal rights. Enrolled students may file an appeal with the Student Grievance Committee. Students also have the right to file a complaint with the U.S. Department of Education alleging that the University has not complied with FERPA.

Questions about FERPA should be addressed to the Office of University Counsel (CB# 9105). The University's FERPA policy and the text of the federal FERPA regulations are available on the Web at www.unc.edu/policies/ferpapol.pdf.

Fireworks, Firearms and Other Weapons

It is a felony, punishable by fine and/or imprisonment, to possess or carry, openly or concealed, any gun, rifle, pistol, or other firearm of any kind, or any dynamite cartridge, bomb, grenade, mine, or powerful explosive on any University campus, in any University-owned or operated facility, or at a curricular or extracurricular activity sponsored by the University. Such conduct may also constitute a violation of the Honor Code.

It is a Class 1 misdemeanor, punishable by fine and/or imprisonment, to possess or carry any BB gun, stun gun, air rifle, air pistol, bowie knife, dirk, dagger, slingshot, leaded cane, switchblade knife,

blackjack, metallic knuckles, razors and razor blades (except for personal shaving), fireworks or any sharp-pointed or edged instrument (except instructional supplies, unaltered nail files and clips and tools used solely for preparation of food, instruction and maintenance) upon any University campus or in any University-owned or operated facility. Such conduct may also constitute a violation of the Honor Code.

Immunization Requirement

Effective July 1, 1986, North Carolina state law requires that no person shall attend a college or university in North Carolina unless a certificate of immunization indicating that the person has received the immunizations required by the law is presented to the college or university on or before the first day of matriculation.

If the UNC-Chapel Hill Medical History Form containing the certificate of immunization is not in the possession of the UNC-Chapel Hill Student Health Service 10 days prior to the registration date, the University shall present a notice of deficiency to the person. The person shall have 30 calendar days from the first day of attendance to obtain the required immunizations. Those persons who have not complied with the immunization requirements by the end of 30 calendar days will be administratively withdrawn from the University.

Military Tuition Benefit

The information in this section comes from three sources: 1) North Carolina General Statutes, Sect. 116-143.3; 2) A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes; and 3) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes and Determination of Eligibility for the Special Military Tuition Benefit. Please refer to the Web site at regweb.unc.edu/residency for the most recent amendments to the Military Tuition Benefit Law.

Certain members of the Armed Services and their dependent relatives who are not residents for tuition purposes may become eligible to be charged the in-state tuition rate under N.C. Gen. Stat. Sect. 116-143.3, the military tuition benefit provision. Any person seeking the military tuition benefit must qualify for admission to UNC-Chapel Hill and must file an application for the benefit with his or her admissions office before the first day of classes of the term for which he or she initially seeks the benefit. The burden of proving eligibility for the military tuition benefit lies with the applicant for the benefit, and the application and all required supporting affidavits must be complete and in proper order before the first day of classes of the term in question. Because of the time involved in securing the necessary affidavits from the appropriate military authorities, prospective applicants for the military tuition benefit are urged to secure application forms from their admissions offices and begin the application process several weeks before the first day of classes of the term for which they seek the benefit.

Eligibility of Members of the Armed Services. To be eligible for this military tuition benefit, the individual must be on active duty and a member of the United States Air Force, Army, Coast Guard, Marine Corps, Navy, North Carolina National Guard, or a reserve component of one of these services and must be abiding in North Carolina incident to active military duty.

Eligibility of Dependent Relatives of Service Members. If the service member meets the conditions set forth above, his or her dependent relatives may be eligible to pay the in-state tuition rate if they share the service member's North Carolina abode, if they have complied with the requirements of the Selective Service System (if applicable), and if they qualify as military dependents of the service member.

Please note: *Special exceptions apply to military personnel and their dependents if the military person is reassigned outside of North Carolina or retires in North Carolina. Please visit regweb.unc.edu/residency to see the most updated requirements to maintain military tuition benefit eligibility (for both active duty military/National Guard and their dependents).*

For a detailed explanation of the military tuition benefit provision, a complete list of categories of persons who are considered "dependent relatives" for purposes of establishing eligibility for the military tuition benefit, and information about the registration requirements of the Selective Service System, applicants should consult *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*. This manual is available for inspection in the Admissions Offices of the University. Copies of the manual are also on reserve at the Robert B. House Undergraduate Library, in the Reserve Reading Room of the Health Sciences Library, and online at regweb.unc.edu/residency (click on "residency manual").

Appeals of Eligibility Determinations of Admissions Officers. A student appeal of an eligibility determination made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within 15 working days after the student receives notice of the eligibility determination. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request by the student, is afforded an opportunity to appear and be heard by the committee.

Any student desiring to appeal a determination of the Residence Status Committee must give notice in writing of that fact to the chair of the Residence Status Committee within 10 days of receipt of the committee's decision. The chair will promptly process the appeal for transmittal to the State Residence Committee.

North Carolina Teachers Tuition Benefit

The information in this section comes from two sources: 1) North Carolina General Statutes Section 116-143.5, and 2) University of North Carolina Administrative Memorandum No. 375, dated October 22, 1997.

Certain North Carolina teachers may become eligible to be charged the in-state tuition rate even if they do not qualify as residents for tuition purposes under G.S. 116-143.1. These applicants may receive the benefit for courses "relevant to teacher certification or to professional development as a teacher" if approved by the principal of the applicant's school.

To qualify, an applicant must be a teacher or other person paid on the North Carolina teacher salary schedule incident to full-time employment by a North Carolina public school. "Full-time employment" means the employee's duties qualify him/her for membership in the Teacher's and State Employees' Retirement System or would so qualify the employee if he/she were employed on a permanent basis. Applicants must qualify academically for admission to UNC-Chapel Hill.

Additionally, to be eligible, an applicant must be a North Carolina legal resident (domiciliary) and must have established North Carolina domicile before the commencement of the approved course(s). However, he or she does not have to have been a legal resident for 12 months.

To apply for the benefit, applicants must submit the following documents to the proper admissions office no later than the first day of

classes of the term for which this benefit is sought:

- A completed North Carolina Teachers Tuition Benefit application,
- A completed "Principal's Declaration for In-State Tuition Benefit for North Carolina Teachers," and
- A four-page application for resident tuition status.

For a detailed explanation of the teachers' tuition benefit law and to acquire application forms, applicants should contact the appropriate admissions office. Information concerning the application of this law is on reserve at the Undergraduate Library and Health Sciences Library. It is also available at all admissions offices, at the Residence Status Committee office and online at regweb.unc.edu/residency.

Appeals of Eligibility Determinations of Admissions Offices must be in writing and signed by the applicant and must be filed by the applicant with that admissions officer within 15 working days after the applicant receives notice of the eligibility determination. The appeal is submitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The applicant is notified of the date set for consideration of the appeal, and, on request by the applicant, is afforded an opportunity to appear and be heard by the committee.

Any applicant desiring to appeal a determination of the Residence Status Committee must give written notice of that fact to the chair of the Residence Status Committee within 10 days of receipt of the committee's decision. The chair will promptly process the appeal for transmittal to the State Residence Committee.

Policy on Illegal Drugs

Introduction

The Board of Trustees of the University of North Carolina at Chapel Hill, in conformity with the direction of the Board of Governors of the University of North Carolina, hereby adopts this Policy on Illegal Drugs, effective August 24, 1988. It is applicable to all students, faculty members, administrators and other employees.

Education, Counseling, and Rehabilitation

A. The University of North Carolina at Chapel Hill has established and maintains a program of education designed to help all members of the University community avoid involvement with illegal drugs. This educational program emphasizes these subjects:
   - The incompatibility of the use or sale of illegal drugs with the goals of the University;
   - The legal consequences of involvement with illegal drugs;
   - The medical implications of the use of illegal drugs; and
   - The ways in which illegal drugs jeopardize an individual's present accomplishments and future opportunities.

B. The University of North Carolina at Chapel Hill provides information about drug counseling and rehabilitation services available to members of the University community through campus-based programs and through community-based organizations. Persons who voluntarily avail themselves of University services are hereby assured that applicable professional standards of confidentiality will be observed.

Enforcement and Penalties

A. The University of North Carolina at Chapel Hill shall take all actions necessary, consistent with state and federal law and applicable University policy, to eliminate illegal drugs from the University community. The University's Policy on Illegal Drugs is publicized in catalogs and other materials prepared for all enrolled and prospective students and in materials distributed to faculty members, administrators, and other employees.

B. Students, faculty members, administrators, and other employees are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as controlled substances in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the University community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the University. It is not "double jeopardy" for both the civil authorities and the University to proceed against and punish a person for the same specified conduct. The University will initiate its own disciplinary proceeding against a student, faculty member, administrator, or other employee when the alleged conduct is deemed to affect the interests of the University.

C. Penalties will be imposed by the University in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators, and other employees, as required by Section 3 of the Trustee Policies and Regulations Governing Academic Tenure in the University of North Carolina at Chapel Hill; by Section III.D. of the Employment Policies for EPA Non-Faculty Employees of the University of North Carolina at Chapel Hill; by regulations of the State Personnel Commission, and the Disciplinary Procedure of the Staff Personnel Administration Guides (Human Resources Manual for SPA Employees), by the Instrument of Student Judicial Governance and by all other applicable provisions of the policies and procedures of the University of North Carolina at Chapel Hill.

D. The penalties to be imposed by the University may range from written warnings with probationary status to expulsions from enrollment and discharges from employment. However, the following minimum penalties shall be imposed for the particular offenses described.

   Trafficking in Illegal Drugs

   a. For the illegal manufacture, sale, or delivery, or possession with intent to manufacture, sell, or deliver, of any controlled substance identified in Schedule I, N.C. Gen, Stat. 90-89, or Schedule II, N.C. Gen. Stat. 90-90 (including, but not limited to, heroin, mescaline, lysergic acid diethylamide, opium, cocaine, amphetamine, methaqualine), any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.

   b. For a first offense involving the illegal manufacture, sale, or delivery, or possession with intent to manufacture, sell, or deliver, of any controlled substance identified in Schedules III through VI, N.C. Gen. Stat. 90-91 through 90-94, (including, but not limited to, marijuana, anabolic steroids, pentobarbital, codeine), the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. (Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a

first offense for employees subject to the State Personnel Act is discharge.) For a second offense, any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.

Illegal Possession of Drugs

a. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. Gen. Stat. 90-89, or Schedule II, N.C. Gen. Stat. 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. (Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.)
b. For a first offense involving the illegal possession of any controlled substance identified in Schedules III through VI, N.C. Gen. Stat. 90-91 through 90-94, the minimum penalty shall be probation, for a period to be determined on a case-by-case basis. A person on probation must agree to participate in a drug education and counseling program, consent to regular drug testing, and accept such other conditions and restrictions, including a program of community service, as the Chancellor or the Chancellor's designee deems appropriate. Refusal or failure to abide by the terms of probation shall result in suspension from enrollment or from employment for any unexpired balance of the prescribed period of probation. (If this balance for an employee subject to the State Personnel Act exceeds one week, that employee shall be discharged.)
c. For second or other subsequent offenses involving the illegal possession of controlled substances, progressively more severe penalties shall be imposed, including expulsion of students and discharge of faculty members, administrators, or other employees.

E. **Suspension Pending Final Disposition**
When a student, faculty member, administrator, or other employee has been charged by the University with a violation of policies concerning illegal drugs, he or she may be suspended from enrollment or employment before initiation or completion of regular disciplinary proceedings if, assuming the truth of the charges, the Chancellor, or in the Chancellor's absence, the Chancellor's designee, concludes that the person's continued presence within the University Community would constitute a clear and immediate danger to the health or welfare of other members of the University community; provided, that if such a suspension is imposed, an appropriate hearing of the charges against the suspended person shall be held as promptly as possible thereafter.

Implementation and Reporting

Annually, the Chancellor shall submit to the Board of Trustees a report on campus activities related to illegal drugs for the preceding year. The reports shall include, as a minimum, the following information:

1. A listing of the major educational activities conducted during the year;
2. A report on any illegal drug-related incidents, including any sanctions imposed;
3. An assessment by the Chancellor of the effectiveness of the campus program; and
4. Any proposed changes in the Policy on Illegal Drugs.

A copy of the report shall be provided to the President, who shall confer with the Chancellor about the effectiveness of campus programs.

Proration of Tuition

If a student withdraws from the University during a fall or spring semester, tuition and fees will be prorated over a period of nine weeks at a rate of approximately one-tenth of the term's bill each week. If a student withdraws during a summer session, tuition and fees will be prorated over a period of three weeks at a rate of one-fourth of the term's bill each week. If a student drops the only course he or she is taking, this constitutes a withdrawal from the University.

Residence Status for Tuition Purposes

The information in this section comes from three sources: 1) North Carolina General Statutes, Sect. 116-143.1, 2) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*, revised September 1985, 3) *Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes*.

The following sections summarize important aspects of the residency law. A complete explanation of the statute and the procedures under the statute is contained in *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes* (hereafter referred to as "the manual"). This manual and other information concerning the application of this law are available for inspection in the Admissions Offices of the University. Copies of the manual are also on reserve at the Robert B. House Undergraduate Library and in the Reserve Reading Room of the Health Sciences Library. All students are responsible for knowing the contents of the statute and the manual. The manual is also available online at regweb.unc.edu/residency. It is a reader-friendly version, written for laypeople rather than for legal personnel.

Every applicant for admission is required to make a statement of his or her length of residence in North Carolina. A person who qualifies as a resident for tuition purposes under North Carolina law pays a lower rate of tuition than a nonresident. To qualify for in-state tuition, a legal resident must have been domiciled in North Carolina for at least 12 months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the state during such 12-month period was for purposes of maintaining a bona fide domicile rather than for purposes of maintaining a mere temporary residence incident to enrollment in an institution of higher education. "Domicile" means one's permanent home of indefinite duration, as distinguished from a temporary place of abode. Domicile is synonymous with legal residence and is established by being physically present in a place with the concurrent intent to make that place a domicile. To determine intent, the University evaluates an individual's objectively verifiable conduct as an indicator of his or her state of mind.

Procedural Information

General. A student admitted to initial enrollment in an institution (or permitted to reenroll following an absence that involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual

matriculation. In the absence of a current and final determination of the student's residence prior to matriculation, the student is classified as a nonresident for tuition purposes. The institution will thereafter reach a final determination of the student's residence status. Unless a person supplies enough information to allow the admissions officer to classify him or her as a resident for tuition purposes, the person will be classified a nonresident for tuition purposes. A residence classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is required to be treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence classification for tuition purposes. The residence classification of a student by one institution is not binding on another institution. The North Carolina institutions of higher education will assist each other by supplying residency information and classification records concerning a student to another classifying institution upon request. A student or prospective student who wants the University to consider his or her "resident" classification by another North Carolina public higher education institution must include, with his or her application for resident status, copies of all the information that was before the other institution at the time that institution classified the student a resident for tuition purposes.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless 1) the affected student requests a reclassification inquiry or 2) the transfer or enrollment occurs following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

Responsibility of Students. Any student who is uncertain about the accuracy of his or her current residence classification for tuition purposes is responsible for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who subsequently becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, is responsible for immediately informing the Office of Admissions in writing of his or her new status. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

Application Process. A person may obtain an application for resident status by visiting his or her admissions office or by going online to regweb.unc.edu/residency. Also available on the Web site is the manual which sets forth the requirements of the statute. Applicants for admission who claim eligibility for the in-state tuition rate customarily complete a two-page residency application as a part of the admissions application packet. If a person has not been living in North Carolina for at least three consecutive years, he or she would complete the four-page "long form." Even if a person completes the two-page residency application, some applicants for admission will thereafter be required to complete a more detailed four-page residency application. Enrolled students seeking a change from nonresident to resident status are required to complete a four-page residency application. All applications for resident status must be filed with the proper admissions office before the end of the term for which resident status for tuition purposes is sought. The last day of the final examination period is considered the last day of the term. Applications for an expired term are not accepted.

After filing a resident status application, a person may receive a letter from his or her admissions office requesting more information in connection with that application. When a student receives such a request before the end of the term for which classification is sought, he or she must respond to that request no later than three weeks after the end of the term. If the student receives the request for supplemental information after the end of the term in question, he or she must supply the requested information within three weeks after receipt of the request. Failure to supply the requested information within the specified time limit will result in a continuation of the student's nonresident classification unless good cause is shown for such failure.

The admissions office may require an applicant for admission to file a residency application or respond to a request for more information more quickly when residence status is a factor in the admissions decision.

For more details about the residency application process and other important information about the resident status for tuition purposes statute, visit regweb.unc.edu/residency.

Fraudulent Applications. If a student is classified a resident for tuition purposes after submitting falsified residency information or after knowingly withholding residency information, the student's application for in-state tuition status is fraudulent. The institution may reexamine any application suspected of being fraudulent and, if warranted, will change the student's residence status retroactively to the beginning of the term for which the student originally made the fraudulent application. If this occurs, the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary action, including dismissal from the institution.

Burden of Proof and Statutory Prima Facie Evidence. A person has the burden of establishing facts that justify his or her classification as a resident for tuition purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the statute, proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence.

a. Even if the person is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the person is not a legal resident of North Carolina unless he or she has lived in this state the five consecutive years prior to enrolling or reregistering. To overcome this prima facie showing of nonresident, a person must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.
b. Conversely, if the person's parents are domiciliaries of North Carolina under the statute, this fact constitutes prima facie evidence that the person is a domiciliary of North Carolina. This prima facie showing may also be overcome by other evidence to the contrary. If a person has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

Erroneous Notices Concerning Classification. If a student who has been found to be a nonresident for tuition purposes receives an erroneous written notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

Grace Period. If a student has been properly classified as a North Carolina resident for tuition purposes and, thereafter, his or her state of legal residence changes while he or she is enrolled in a North Carolina public institution of higher education, the statute provides for a grace period during which the student is allowed to pay tuition at the in-state rate despite the fact that the student is no longer a North Carolina legal resident. This grace period extends for a minimum of 12 months from the date of change in legal residence, and if the 12-month period ends during a semester or academic term in which the student is enrolled, the grace period extends also to the end of that semester or academic term.

Reacquisition of Resident Tuition Status. The prescribed 12-month period of legal residence may be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and reestablished North Carolina domicile within 12 months after abandoning it. Interested persons should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

Appeals. A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within 15 working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and on request of the student, he or she is afforded the opportunity to appear and be heard by the committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact (within 10 days of receipt of the committee's decision) to the chair of the Residence Status Committee, and the chair promptly processes the appeal for transmittal to the State Residence Committee.

Tuition Payment. It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

Application of the Law to Specific Situations

Aliens. Aliens who are permanent residents of the United States, or who hold a visa that will permit eventual permanent residence in the United States, are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the United States under a visa conditioned at least in part upon intent not to abandon a foreign domicile (e.g., B, F, J, P, Q, and S visas) cannot be classified a resident. An alien abiding in the United States under a visa issued for a purpose that is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal residence (e.g., C, D, and M visas) cannot be classified a resident.

Possession of certain other immigration documents may also allow an alien to be considered for in-state tuition status. For more details, aliens should consult their admissions offices and the manual. Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident status for tuition purposes. Aliens should also provide a copy of the front and back of the document(s) that they claim allow them to remain in the United States and establish a legal residence. More information concerning alien resident status for tuition purposes information and supplemental applications may be found online at regweb.unc.edu/residency.

Married Persons. The North Carolina resident status for tuition purposes statute provides a special provision for legal residents who are married. This provision is called the "spouse-pair" provision.

The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed, solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of the student's spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

If a person otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina before the beginning of the term for which resident status is sought, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than 12 months, by reference to the length of the legal residence of the person's spouse, if the spouse has been a legal resident of the state for the requisite 12-month period.

Please note: If a person feels he or she qualifies for the marital status provision, special application procedures must be followed. A separate supplemental spousal residency application should be filed at the same time as either the short or long residency form is submitted. The spousal residency application may be filed after an admissions office's initial decision if the student seeks to appeal that decision. The admission office residency decision letter provides instructions on where to file the appeal (with or without a spousal residency application). Residency applications of persons who are married and claiming the North Carolina "spouse-pair" provision are not to be submitted to the admissions office. They should be filed with the Residence Status Committee Office located in the University Registrar's Office on campus. Applications are available online at regweb.unc.edu/residency.

Military Personnel. The domicile of a person employed by the federal government, Department of Defense, is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the state of North Carolina. See the section entitled "Military Tuition Benefit" for other benefits provided to military personnel and their dependents.

Minors. A minor is any person who has not reached the age of 18 years. Under the common law, a minor child whose parents are not divorced or legally separated is presumed to have the domicile of his or her father. This presumption may be rebutted if a preponderance of the evidence indicates that the mother and father have separate domiciles and that, under the circumstances, the child can fairly be said to derive his or her domicile from the mother. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father. If the minor lives for part of the year with each parent, in the absence of a custody award, the

minor's domicile is presumed to remain that of the father. If the minor has lived in North Carolina for five years as set forth above in "Burden of Proof and Statutory Prima Facie Evidence," subsection a, the common law presumptions do not absolutely control on the issue of the minor's domicile, but they continue to be very strong evidence thereof.

In determining residence status for tuition purposes, there are three exceptions to the above provisions:

- If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.
- If immediately prior to his or her 18th birthday a person would have been deemed a North Carolina legal resident under this provision but he or she achieves majority before enrolling in a North Carolina institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:
  a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and
  b. The person must begin enrollment at a North Carolina institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.
- If immediately prior to beginning an enrolled term the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative during those years has functioned as a de facto guardian of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her 18th birthday, then, upon becoming 18, he or she will be deemed a legal resident of North Carolina of at least 12 months' duration.

Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. Sect. 7A-717, et seq., he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile has, in fact, been established.

Prisoners. There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the manual.

Property and Taxes. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time. A student is more likely to obtain a final decision on an application before tuition payment is due if he or she files the application several months in advance.

New Benefit for UNC Employees and Related Persons

A new subsection (m) has been added to the N.C. residency statute G.S. 116-143.1 that provides a new employment-connected benefit.

In the new subsection, full-time, permanent employees of UNC who are legal residents of North Carolina qualify for the in-state tuition rate even if they do not meet the 12-month requirement.

Further, this new classification category includes spouses and dependent children of the employee. The employee must be full-time, permanent, and a legal resident of North Carolina. Further, if it is a child who seeks to qualify, the child must be a dependent (as defined by tax dependency laws). Finally, if the person qualifies for this benefit, there is no limit on the number or type of courses for which the classification will apply. The effective date of this provision was July 1, 2005.

Please visit regweb.unc.edu/residency to learn more about residence status for tuition purposes.

Student Right-to-Know Act

Pursuant to the federal Student Right-to-Know Act, we report that, in 2007–2008, the completion or graduation rate for undergraduates who entered the University of North Carolina at Chapel Hill in 2001 on a full-time basis was 82.6 percent.

Students' Education Records at the Office of the President, The University of North Carolina: Annual Notification of Rights

Certain personally identifiable information about students ("education records") may be maintained at the University of North Carolina Office of the President, which serves the Board of Governors of the University system. This student information may be the same as, or derivative of, information maintained by a constituent institution of the University; or it may be additional information. Whatever their origins, education records maintained at the Office of the President are subject to the federal Family Educational Rights and Privacy Act of 1974 (FERPA).

FERPA provides that a student may inspect his or her education records. If the student finds the records to be inaccurate, misleading, or otherwise in violation of the student's privacy rights, the student may request amendment to the record. FERPA also provides that a student's personally identifiable information may not be released to someone else unless 1) the student has given a proper consent for disclosure or 2) provisions of FERPA or federal regulations issued pursuant to FERPA permit the information to be released without the student's consent.

A student may file with the United States Department of Education a complaint concerning failure of the Office of the President or an institution to comply with FERPA.

The policies of the University of North Carolina Office of the President concerning FERPA may be inspected in the office at each constituent institution designated to maintain the FERPA policies of the institution. Policies of the Office of the President may also be accessed in the Office of the Secretary of the University of North Carolina, 910 Raleigh Road, Chapel Hill, N.C.

Further details about FERPA and FERPA procedures at the Office of the President are to be found in the referenced policies. Questions about the policies may be directed to Legal Section, Office of the President, The University of North Carolina, Annex Building, 910 Raleigh Road, Chapel Hill, N.C. (mailing address P.O. Box 2688, Chapel Hill, N.C. 27515-2688; tel: [919] 962-4588).

Tuition Waiver for Family Members of Deceased or Disabled Emergency Workers

The information in this section comes from three sources: 1) North Carolina General Statutes Section 115B-1 et seq., 2) University of North Carolina Administrative Memorandum No. 377, dated November 17, 1997 and 3) University of North Carolina Administrative Memorandum No. 385, dated August 6, 1998.

Certain family members of emergency workers killed or permanently disabled in the line of duty may become eligible for tuition-free enrollment.

The statute sets out the following requirements that must be met before the waiver can be obtained:

- The deceased or disabled emergency worker (firefighter, volunteer firefighter, law enforcement officer, or rescue squad member) must have been a North Carolina legal resident (domiciliary), in active service or training for active service at the time of death or disability occurring in the line of duty;
- The emergency worker's death or disability must have occurred on or after October 1, 1997;
- The emergency worker must have been employed by the State of North Carolina or any of its departments, agencies, or institutions, or a county, city, town, or other political subdivision of the State of North Carolina;
- The applicant for the tuition waiver must be either a child or unremarried widow or widower of a deceased emergency worker killed in the line of duty, or a spouse or a child (at least age 17, but not yet 23) of an emergency worker who became permanently and totally disabled as a result of a traumatic injury sustained in the line of duty as an emergency worker;
- The applicant must qualify academically for admission to UNC-Chapel Hill, must meet all the requirements of the statute and implementing University regulations, and there must be space available in the course(s) for which he or she intends to register; and
- The completed application, with all supporting documents, must be submitted to the proper admissions office no later than the first day of class of the term for which the waiver is sought. If the applicant is under 18 years of age, a parent must also sign.

The following documents are required as proof of eligibility for this tuition waiver:

To prove permanent and total disability of an emergency worker:

- Documentation of the permanent and total disability from the North Carolina Industrial Commission

To prove cause of death of an emergency worker:

- Certification of the cause of death from the Department of State Treasurer; or
- The appropriate city or county law enforcement agency that employed the deceased; or
- The administrative agency for the fire department or fire protection district funded under the Department of State Auditor; or
- The administrative agency having jurisdiction over any paid firefighters of all counties and cities

To prove the parent/child relationship:

- Applicant's birth certificate or legal adoption papers

To prove the marital relationship:

- Applicant's marriage certificate

Copies of the applicable law and implementing University regulations are on reserve in the Undergraduate Library and the Health Sciences Library. They are also available for inspection upon request in all UNC-Chapel Hill admissions offices and the Residence Status Committee Office. Applications can be acquired at the proper admissions office. More detailed information may be found online at regweb.unc.edu/residency.

Appeals of Eligibility Determinations of Admissions Offices must be in writing and signed by the applicant and must be filed by the applicant with that admissions officer within 15 working days after the applicant receives notice of the eligibility determination. The appeal is submitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The applicant is notified of the date set for consideration of the appeal, and, on request by the applicant, is afforded an opportunity to appear and be heard by the committee.

Any applicant desiring to appeal a determination of the Residence Status Committee must give written notice of that fact to the chair of the Residence Status Committee within 10 days of receipt of the committee's decision. The chair will promptly process the appeal for transmittal to the State Residence Committee.

UNC Campus Scholarships Programs—Undergraduates (Effective July 1, 2003)

The University of North Carolina offers a two-part scholarship program to promote educational access and diversity.

Part I provides need-based scholarships for undergraduate students with exceptional financial need whose enrollment contributes to the intellectual experiences and diversity of the undergraduate population. Students must be residents of North Carolina who are enrolled in full-time degree credit course work.

Part II provides need-based scholarship for undergraduate Native American students. To be eligible for these funds, students must be residents of North Carolina and must be Native American, defined as an individual who maintains cultural and political identification as a Native American through membership in an Indian tribe recognized by the State of North Carolina or by the United States.

UNC Campus Scholarships Programs—Doctoral and Law (Effective July 1, 2003)

The University of North Carolina seeks to enhance access to and diversity within the graduate programs and law program at the University of North Carolina at Chapel Hill. Stipends are available for the traditional academic year (nine months), with an option of additional support for study in the summer session. Recipients must be residents of North Carolina and full-time students pursuing doctoral degrees or law degrees at the University of North Carolina at Chapel Hill.

ITS Franklin Annex
ITS Franklin
208 W. Franklin St.
Bank of America Center
Courtyard
PICKARD
Horace Williams House
WEST FRANKLIN STREET
EAST FRANKLIN STREET
University Square
COLONY CT.
FRATERNITY CT.
134 E. Franklin St.
Hill Commercial Bldg.
Porthole Building
Ackland
Hill Annex
Hanes Art Center
Evergreen
Mrs. Compton Music Building
Hill
Battle
Vance
Pettigrew
Hyde
Graham Memorial
Sundial
McCorkle Place
Person
Visitors' Center
Marshall Planetarium
Coker Arboretum
President's Residence
Love House & Hutchins Forum
Hickerson House
HOOPER LANE
Alderman
Brooks Hall
SENLAC ROAD
McIver
Swain
Mary Ellen Smith
New West
Old West
Old Well
Old East
New East
Davie Hall
EAST CAMERON AVENUE
WEST CAMERON AVENUE
215 W. House Cameron Ave.
210 Pittsboro St.
Carolina Inn
Peabody
Phillips
Memorial
Gerrard
South
Campus Y
PlayMaker Theatre
Cat
Caldwell
Graves
Mary
Aycock
Graham
Lower Quad
Upper Quad
Forest Theatre
Sitterson
Sitterson Addition
Chapman
Carroll
Phillips Annex
Hanes
Polk Place
Saunders
Manning
Taylor
Ruffin
Ransom
Lewis
Everett
Stacy
Jackson
Cobb
Battle Park
Gardner
Murphey
Davis Library
Lenoir
Dey
Old Venable Site
Miller
Winnifred
NROTC
Morehead Labs
Kenan Labs
Caudill Labs
Wilson Library
House Undergrad Library
Daniels Student Stores
Frank Porter Graham Student Union
The Pit
Cobb Parking Deck
Cobb Plant
Center for Dramatic Art Paul Green Theatre
Alexander
Wrenn
Cemetery
Memorial Grove
McCauley Street
Vance Street
Pittsboro Street
South Columbia Street
Rankin Street
University Dr.
Bell Tower
Stone Cultural Center
Wilson
Coker
Mitchell
Graham Memorial
Health Affairs Book Store
Bell Tower Parking Lot
Carrington
Berryhill
Parker Hall
Bradham-Baity
Taylor
Beard
Tarson
Dunstan
Venable
Chemistry
Kenan Football Center
Kenan Stadium
Fetzer Gymnasium
SRC
Woollen
Carmichael Auditorium
Hooker Fields
Fetzer Grandstands
Belk Track & Fetzer Field
Eddie Smith Field House
Navy Field
Knapp-Sanders
Stone & Government Parking Deck
Raleigh Road
to N.C. 54 and Friday Center
Hwy. 54 Lot
Country Club Road
Fordham Drive
Ridge Road
Ben Hecht Track
Kenan Stadium
Dean Hall Tower
SAFC
Bill Lumsden Stadium
Ram House Recreation Center
Ram House Parking Deck
Dean Dickson Hall for Ram House
Avery
Ehringhaus Field
Bryson Field
Student Academic Services
Ehringhaus
Koury
Horton
James
Ram Village at Williamson Dr.
Tennis Courts
Outdoor Education Center
Tennis Courts
Coker Pinetum and Meeting at the Waters Creek
Pine Lane
Buttons Lane
Lewis Hill Road
Ferry Lane
Iris Line
Williamson Drive
Skipper Bowles Drive
Manning Drive
Craige Drive
Craige North
Craige
Ram Village at Paul Hardin Dr.
540
550
560
William Blythe Drive
Craige Parking Deck
Manning Sub-Station
Morehead Steam Plant
Student Family Housing
Odum Village
Richard Davis
Community Service
Hinton James Parking
Educational Foundation Parking Deck
Kenan Center Drive
McColl
Kenan Center
Dean E. Smith Student Activities Center
Koury Natatorium
East Chiller
Baity Hill Student Family Housing
2000
1900
1800
1600
1700
Baity Hill Drive
Brock Family Medicine
Mason Farm Road
Purefoy Road
Whitehead Circle
Ditch Road
US 15-501 / NC 54 BYPASS
Fordham Blvd
NC Botanical Gardens
Totten Spring
Glenburnie Drive
Evergreen Lane
Gimghoul Road
Cobb Parking Deck
Cobb Plant
Center for Dramatic Art Paul Green Theatre
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Kenan Football Center
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Tennis Courts
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Craige North
Craige
Ram Village at Paul Hardin Dr.
540
550
560
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