If, after reading this Catalog, you have further questions or specific inquiries about the programs of, or admission to, the University of North Carolina at Charlotte, please look below to find the proper office to contact. Address correspondence to any of the offices in care of:

The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, North Carolina 28223-0001

INFORMATION
Campus Operator..................................... 704-687-2000
Academic Affairs.................................... 704-687-2224
Admissions
Graduate .............................................. 704-687-3366
International................................. 704-687-2694
Undergraduate ................................. 704-687-2213
Bookstore ........................................... 704-687-4584
Brocker Health Center......................... 704-687-4617
College of
Architecture ....................................... 704-687-2358
Arts & Sciences ................................. 704-687-4303
Business Administration .................... 704-687-2165
Education ........................................... 704-687-4707
Engineering ....................................... 704-687-2301
Health and Human Services ................. 704-687-4650
Information Technology .................... 704-687-3119
Cone University Center ....................... 704-687-2267
Continuing Education and Extension ... 704-687-2424
Counseling Center.............................. 704-687-2105
Dean of Students ............................... 704-687-2375
Financial Aid ...................................... 704-687-2461
Graduate School
Admissions ........................................... 704-687-3366
Dean's Office ...................................... 704-687-3371
International Admissions..................... 704-687-2694
International Programs....................... 704-687-2442
J. Murrey Atkins Library
Circulation ....................................... 704-687-2392
Reference ......................................... 704-687-2241
REAL System .................................... 704-687-5700 (off campus)
........................................... 704-687-7549 (on campus)
Records/Registration ......................... 704-687-3487
Residence Life .................................... 704-687-2585
Student Affairs ..................................... 704-687-2206
Summer Programs ................................... 704-687-2424

EMERGENCY NUMBERS
Campus Police – Emergency............... 911 (on campus)
........................................... 704-687-2200 (off campus)
Director of Public Safety and Non-Emergency
Calls.................................................. 704-687-2282
Health Services
(radio contact with police) ................. 704-687-4617
Inclement Weather ............................ 704-687-2877

About This Catalog...

Although the publisher of this catalog has made every reasonable effort to attain factual accuracy herein, no responsibility is assumed for editorial, clerical or printing errors, or errors occasioned by mistakes. The publisher has attempted to present information that, at the time of preparation for printing, most accurately describes the course offerings, faculty listings, policies, procedures, regulations and requirements of the University. However, it does not establish contractual relations. The University reserves the right to alter or change any statement contained herein without prior notice.

Graduation Rate Disclosure Statement
Our data show that 55% of the full-time new freshmen who entered UNC Charlotte in Fall 1995 have received a baccalaureate from this institution or another UNC institution as of Fall 2001. In addition, another 6% were enrolled at this or another UNC institution in pursuit of their baccalaureate degree as of Fall 2001. This information is provided pursuant to requirements of the Student-Right-to-Know and Campus Security Act of 1990.

Published by the Graduate School, June 2002.

Cover Design by Steve Thomas (Set? Communicate!, Inc.) and by the UNC Charlotte Graduate School.

20,000 copies of this public document were printed at a cost of $24,527.00 or $1.22 per copy
The University of North Carolina at Charlotte is open to people of all races, committed to equality of educational opportunity, and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age, or disability. Moreover UNC Charlotte actively seeks to promote integration by recruiting and enrolling a large number of African-American, Native-American, and other ethnically diverse students.
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Dates pertaining to changes in enrollment and refunds are included in the calendars that appear in the Schedule of Classes each semester and in the summer sessions bulletin.

FALL SEMESTER, 2002
Academic year begins.................................................................Wednesday, August 14
Orientation, Advising, Registration ...........................................Wednesday-Friday, August 14-16
First class day ............................................................................Monday, August 19
Labor Day (no classes)(University closed) .................................Monday, September 2
Fall recess (no classes) ...............................................................Friday, October 11
Thanksgiving recess (no classes) .................................................Wednesday-Friday, November 27-29
Last class day ............................................................................Friday, December 6
Final examinations .....................................................................Saturday, December 7, Monday-Friday, December 9-13
Commencement ........................................................................Saturday, December 14

SPRING SEMESTER, 2003
Orientation, Advising, Registration ...........................................Wednesday-Friday, January 8-10
First class day .............................................................................Monday, January 13
Martin Luther King Day (no classes)(University closed) ..........Monday, January 20
Spring recess (no classes) ................................................................Monday-Friday, March 10-14
Last class day .............................................................................Monday, May 5
Final examinations .....................................................................Tuesday-Saturday, May 6-10, Monday, May 12
Commencement ........................................................................Sunday, May 11
Academic year ends...................................................................Tuesday, May 13

FIRST SUMMER TERM, 2003
Registration ..................................................................................Tuesday, May 27
First class day .............................................................................Wednesday, May 28
Last class day .............................................................................Friday, July 1
Final examinations .......................................................................Wednesday-Thursday, July 2-3

SECOND SUMMER TERM, 2003
Registration ..................................................................................Thursday, July 3
Fourth of July (no classes)(University closed) .........................Monday, July 4
First class day .............................................................................Friday, July 7
Last class day .............................................................................Friday, August 8
Final examinations .......................................................................Monday-Tuesday, August 11-12

FALL SEMESTER, 2003
Academic year begins.................................................................Monday, August 18
Orientation, Advising, Registration ...........................................Wednesday-Friday, August 20-22
First class day .............................................................................Monday, August 25
Labor Day (no classes)(University closed) ...................................Monday, September 1
Student recess (no classes) ...........................................................Friday, October 10
Thanksgiving recess (no classes) ..................................................Wednesday-Friday, November 26-28
Last class day .............................................................................Friday, December 12
Final examinations .....................................................................Saturday, December 13, Monday-Friday, December 15-19
Commencement ........................................................................Saturday, December 20

SPRING SEMESTER, 2004
Orientation, Advising, Registration ...........................................Sunday-Tuesday, January 10-13
First class day .............................................................................Wednesday, January 14
Martin Luther King Day (no classes)(University closed) .........Monday, January 19
Spring recess (no classes) .............................................................Monday-Friday, March 8-12
Last class day ...............................................................................Wednesday, May 5
Final examinations .......................................................................Thursday-Saturday, May 6-8, Monday-Wednesday, May 10-12
Commencement .........................................................................Saturday, May 15
Academic year ends...................................................................Monday, May 17

FIRST SUMMER TERM, 2004
Registration ..................................................................................Wednesday, May 26
First class day .............................................................................Thursday, May 27
Last class day .............................................................................Wednesday, June 30
Final examinations .......................................................................Thursday-Friday, July 1-2

SECOND SUMMER TERM, 2004
Registration ..................................................................................Friday, July 2
First class day .............................................................................Tuesday, July 6
Fourth of July (no classes)(University closed) .........................Monday-Friday, July 5
Last class day ...............................................................................Monday, August 9
Final examinations .......................................................................Tuesday-Wednesday, August 10-11
THE UNIVERSITY

HISTORY OF THE UNIVERSITY OF NORTH CAROLINA

In North Carolina, all public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. The University of North Carolina at Chapel Hill was one of the 16 constituent institutions of the multi-campus state university.

The University of North Carolina, chartered by the N.C. 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 eighteenth 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 N.C. 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 N.C. 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 (now North Carolina State University at Raleigh), and Woman's College (now the University of North Carolina at Greensboro). The new multi-campus 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 ten 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, the North Carolina School of the Arts, Pembroke State University (now the University of North Carolina at Pembroke), Western Carolina University, and Winston-Salem State University. This action created the current 16-campus University. (In 1985, the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University.)

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 of Governors are elected by the General Assembly for four-year terms. Former board chairmen and board members who are former governors of North Carolina may continue to serve for limited periods as non-voting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a non-voting member.

Each of the 16 constituent institutions 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 NC 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 AT CHARLOTTE

UNC Charlotte aspires to be North Carolina's most energetic and responsive public University, offering excellent educational opportunities at the undergraduate and graduate levels in the liberal arts and sciences and selected professions. The University provides intellectual leadership for addressing the educational, cultural, economic, social and research needs of its local, state and national constituencies, in an environment distinguished by its nationally renowned faculty. Through their engagement in programs of instruction, scholarship and public service, the University responds to the demands of an increasingly complex world and the dynamics of a burgeoning metropolitan region.

The University offers programs leading to baccalaureate, master's and doctoral degrees as well as programs leading to professional licensure in architecture, business, education, engineering, health professions, the humanities, information technology, the physical and biological sciences, and the social and behavioral sciences. In order to meet the growing need for higher education in the Charlotte region and in the State, the University continues to expand its degree programs and its continuing education non-degree offerings.

The University is committed to excellence through informed and effective teaching in all its academic programs and emphasizes undergraduate instruction as
the foundation of life-long learning and advanced formal education. It selects students who have demonstrated a willingness to learn, a capacity to benefit from a broad array of intellectual resources, and the potential to participate in the opportunities offered by the changing global society. University programs are open to all qualified students without regard to race, color, national origin, gender, age, religious belief, sexual orientation, or disability. Participation by students from other states and nations is welcomed.

The academic programs of the University are offered on-campus and off-campus, and through e-learning and continuing education. These programs are augmented by student support and development activities and through a wide variety of collaborative relationships that expand the classroom into the region.

The size and distinction of its research programs reflects its nationally competitive faculty. Recruited from across the world, they engage in both basic and applied research. Their scholarly inquiry informs both graduate and undergraduate instruction, and takes advantage, when appropriate, of the University’s location in a diverse and expanding metropolitan region.

Leadership in public service is provided through campus-based programs and consulting and cooperative arrangements with local, regional, national, and international organizations. The University strives to maintain a campus environment that encourages the active involvement of students in their personal and intellectual development, including opportunities to learn leadership skills. The University serves its neighboring community through a variety of public events and outreach activities involving members of the faculty, staff, and student body. The citizens of the region are regularly invited to share in the broad range of opportunities generated by the campus, including athletics, the performing and visual arts, continuing education opportunities, and many other speakers, workshops, and outreach activities.

UNC Charlotte was founded in 1946 to serve returning veterans of World War II. Over the course of its history, the student body has expanded to include many diverse populations. Of late, the age of the undergraduate student body is increasingly traditional. This dynamic has led the University to develop a large residential campus. Within this growing residential environment, the University retains its historic commitment to serving a diverse student population, including ethnic minorities, part-time students, persons with disabilities, and non-traditional students in a welcoming, positive, and healthful learning environment.

As one of the fastest growing universities in the State, UNC Charlotte has established a tradition of careful planning and intelligent stewardship to assure the most efficient use of its facilities and resources. The UNC Board of Governors has classified the University as a Doctoral/Research-Intensive institution. The University will continue to expand as resources from both public and private sources grow.

**Institutional Mission Statement**

UNC Charlotte is the only Doctoral/Research-Intensive University in the Charlotte region, fully engaged in the discovery, dissemination, synthesis, and application of knowledge. It provides for the educational, economic, social, and cultural advancement of the people of North Carolina through on- and off-campus programs, continuing personal and professional education opportunities, research, and collaborative relationships with private, public, and nonprofit institutions. UNC Charlotte has a special responsibility to build the intellectual capital of this area. As such it serves the research and doctoral education needs of the greater Charlotte metropolitan region.

The primary commitment of UNC Charlotte is to extend educational opportunities and to ensure success for qualified students of diverse backgrounds through informed and effective teaching in the liberal arts and sciences and in selected professional programs offered through Colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, Health and Human Services, and Information Technology and through programs and services designed to support student's intellectual and personal development. The University offers an extensive array of baccalaureate and master’s programs and a number of doctoral programs.

With a broad institutional commitment to liberal education as the foundation for constructive citizenship, professional practice, and lifelong learning, UNC Charlotte is prepared to focus interdisciplinary resources to address seven broad areas of concern to the Charlotte region: 1) Liberal Education; 2) Business and Finance; 3) Urban and Regional Development; 4) Children, Families, and Schools; 5) Health Care and Health Policy; 6) International Understanding and Involvement; and 7) Applied Science and Technologies.

**Equal Opportunity and Affirmative Action**

The University of North Carolina at Charlotte is dedicated to equal opportunity through affirmative action within the University community. The University’s Affirmative Action Program is designed to provide equal consideration of all applicants for faculty and staff positions, for all faculty members in the tenure and promotion process, for administrators and other staff members seeking promotions and upgrades, as well as for students seeking admission, financial aid, and equality in academic and athletic programs.

In keeping with this policy, faculty and staff are recruited, hired, and promoted without regard to race, color, religion, sex, national origin, age, sexual orientation, or any non-relevant disability. The University actively
The University recruits students from protected categories and provides opportunities for the growth and development of these students.

The University's Affirmative Action Program was established in 1973 and includes the monitoring and reporting of compliance with applicable laws and regulations including Titles VI and VII of the Civil Rights Act of 1964, as amended; Executive Order 11246, as amended by Executive Order 11375; Revised Order No. 4; the Equal Pay Act of 1963, as amended; the Rehabilitation Act of 1973 as amended; the Vietnam Era Veteran's Rehabilitation Act of 1974; Titles VII and VIII of the Public Health Service Act; Title IX of the Education Amendments of 1972; The Americans with Disabilities Act; and all applicable laws and ordinances of the State of North Carolina. The University has a published Affirmative Action Plan, copies of which have been distributed to all departments and offices. Copies have also been placed on reserve in the Library.

The Director of Human Resources serves as the Affirmative Action Officer and is responsible for ensuring the University's commitments are met. Contact the Director of Human Resources, 225 King Building, 704-687-4269.

Discriminatory Personal Conduct
The University seeks to promote a fair, humane, and respectful environment for its faculty, staff, and students. To that end, University policy explicitly prohibits sexual harassment, racial harassment, and all other personal conduct which inappropriately asserts that sex, race, ethnicity, sexual orientation, disability, or ancestry are relevant to consideration of individual worth or individual performance. The same policies provide procedures for the informal or formal resolution of instances where such behavior is suspected or alleged. The policies have received wide distribution and are available for inspection in all administrative offices on campus.

ACADEMIC STRUCTURE
UNC Charlotte is organized into four administrative divisions: Academic Affairs, Business Affairs, Development and University Relations, and Student Affairs. The Division of Academic Affairs includes Enrollment Management; Graduate Programs; Library; Information Services; Extended Academic Programs; International Programs; Research; and seven colleges, the Colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, Health and Human Services, and Information Technology. The colleges offer more than 80 undergraduate and 50 master's degree options and sixth-year Certificates of Advanced Study, nine doctoral programs and more than 15 graduate certificate options. Many of the departments throughout the University are involved in teacher education. The College of Education, advised by the University Teacher Education Committee, is responsible for these programs.

ACCREDITATION
UNC Charlotte is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureate, master's, intermediate, and doctoral degrees.

The Bachelor of Architecture program is accredited by the National Architectural Accrediting Board (NAAB). The Department of Chemistry is on the approval list of the American Chemical Society. The Master of Public Administration program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA). The Bachelor of Social Work program is accredited by the Council on Social Work Education (CSWE). The programs in business and accounting are accredited by AACSB - The International Association for Management Education. The University's professional education programs for PK-12 teachers, counselors, and administrators are approved by the North Carolina Department of Public Instruction (NCDPI) and accredited by the National Council for Accreditation of Teacher Education (NCATE). The School Counseling and Agency (Community) Counseling programs in Counselor Education are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The civil, electrical, and mechanical engineering programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone: (410) 347-7700 and those in the civil, electrical, and mechanical engineering technology programs by the Technology Accreditation Commission of ABET. The Nursing programs are accredited by the Commission on Collegiate Nursing Education (CCNE); and the Nursing Anesthesia program is accredited by the Council on Accreditation of Nursing Anesthesia Educational Programs (CANAEAP).

The University is a member of the Council of Graduate Schools, the Conference of Southern Graduate Schools, and The North Carolina Association of Colleges and Universities.
The Graduate School

Administration
Thomas L. Reynolds, Associate Provost for Graduate Programs and Dean of the Graduate School

Andrew Harver, Interim Associate Dean of the Graduate School
Vacant, Assistant Dean for Graduate Student Affairs
Johnna W. Watson, Assistant Dean for Enrollment Management and Information Systems

Kenneth Lambla, Dean, College of Architecture
Schley R. Lyons, Dean, College of Arts and Sciences
Claude C. Lilly III, Dean, Belk College of Business Administration
Mary Lynne Calhoun, Dean, College of Education
Robert E. Johnson, Dean, The William States Lee College of Engineering
Sue M. Bishop, Dean, College of Health and Human Services
Mirsad Hadzikadic, Dean, College of Information Technology

HISTORY AND ORGANIZATION OF THE GRADUATE SCHOOL

The University of North Carolina at Charlotte was established in 1965 by the North Carolina General Assembly which transformed Charlotte College, with beginnings in 1946, into a campus of The University of North Carolina. The Graduate School was established in 1985 with the appointment of the first Dean of the Graduate School, although graduate degree programs had been offered since 1969. Today more than 660 members of the Graduate Faculty and more than 3,100 graduate students participate in a broad array of graduate programs at the master's and doctoral levels and in graduate certificate programs.

The executive and administrative affairs of the Graduate School are carried out by the Associate Provost for Graduate Programs and Dean of the Graduate School, who acts in cooperation with the deans of the seven colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, Health and Human Services, and Information Technology.

The Graduate Council
The Graduate Council, whose voting members are elected by the Graduate Faculty, reviews, develops and makes recommendations concerning Graduate School policy. All curricular proposals and all criteria for membership on the Graduate Faculty come before the Graduate Council. In addition, the Graduate Council serves in an advisory capacity to the Dean of the Graduate School.

The Graduate Faculty
In accordance with criteria developed by each graduate program or unit and approved by the Graduate Council, the Dean of the Graduate School appoints members of the Graduate Faculty for renewable terms. Members of the Graduate Faculty offer courses and seminars, mentor graduate students, and supervise research at an advanced level of scholarship.

The Graduate Directors and Coordinators
Each graduate program, and in some cases certain program areas within a discipline, has either a Graduate Director or Coordinator. This individual is a member of the Graduate Faculty and is responsible for coordinating various functions of the departmental graduate program. Directors and Coordinators assist students with understanding program requirements (along with the student’s specific advisor) and can answer program specific questions such as transfer credit, prerequisites, program specific admission requirements, etc.

GRADUATE PROGRAMS

Doctoral or Master's Degree Programs
UNC Charlotte offers more than 65 doctoral and master’s degree programs. To be admitted to a degree program, an applicant must meet all the requirements for admission, be recommended by the department in which he/she proposes to study and receive the approval of the Graduate School. Acceptance into one graduate program does not guarantee acceptance into any other program. Acceptance into each program must be recommended by the department or college offering the program and approved by the Graduate School.

Graduate Certificate Programs
Graduate certificate programs are mechanisms for students who wish to complete a coherent graduate program in a defined area in which they do not wish to pursue a degree. Students are admitted to a specific graduate certificate program and are advised by faculty in the unit offering the graduate certificate. Since the graduate certificate is not a degree, students may apply the credits earned in the certificate program toward a degree that they pursue either concomitant with pursuing a graduate certificate or after the certificate has been awarded.
Post-Baccalaureate (Non-Degree) Study

Applicants seeking to take courses beyond the baccalaureate degree for license renewal, for transfer to another institution, as prerequisites for admission to a graduate degree program or for personal satisfaction may be admitted as post-baccalaureate students. A post-baccalaureate student who is subsequently admitted to full standing in a degree program may, with the permission of his/her advisor, apply a maximum of six hours acceptably completed in the post-baccalaureate status toward a degree.

International Students should contact the Office of International Admissions before applying for this classification.

Dual Undergraduate/Graduate Registration

Undergraduate students at UNC Charlotte who are required to take fewer than 12 semester hours of undergraduate work to fulfill all requirements for the bachelor's degree may be allowed during their final semester to enroll in certain courses for the purpose of obtaining graduate credit. Authorization for dual undergraduate/graduate registration may be obtained by submitting to the Graduate School a Special Request Form approved by the student's undergraduate academic adviser, the instructor(s) of the graduate course(s), and the dean(s) of the college(s) offering the graduate course(s), accompanied by a post-baccalaureate application and payment of the application fee. Graduate-level tuition rates will apply. The total hours to be carried in this status shall not exceed 12 hours, of which no more than nine may be for graduate credit. On the basis of work attempted prior to the final semester, such student must meet the grade point criteria for admission to a graduate degree program at the University. No course for which credit is received and applied to an undergraduate degree may receive graduate credit unless the student is accepted into an Early-Entry program (see below). Permission to take graduate courses under dual registration does not constitute admission to any graduate degree program at the University.

Readmission – All Students

Post-baccalaureate, graduate certificate and degree students whose enrollment is interrupted will remain eligible to register for two calendar years without having to reapply for admission to the University if they are in good standing and have not exceeded the six or eight-year limit for their academic program of study. After an absence of more than 24 months, the student must apply for readmission; acceptance is subject to department or program approval. Students whose enrollment is terminated for academic reasons should consult the description of the procedure outlined in the “Requirements for Readmission” section of the Catalog.

Early-Entry to Graduate Programs

Exceptional undergraduate students at UNC Charlotte may be accepted into some master's programs and begin work toward a graduate degree before completion of the baccalaureate degree. In those programs offering this option, an applicant may be accepted at any time after completion of 75 or more undergraduate credit hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken. These students will have provisional acceptance status, pending the award of the baccalaureate degree.

To be accepted in this program, an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test and have earned an acceptable score. A given program may have more rigorous admissions criteria. If an early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work. No courses taken before admission to the graduate program may be applied to a graduate degree.

Some early-entry programs are also accelerated. Under this model, ordinarily up to six hours earned at the graduate level may be substituted for required undergraduate hours. In other words, up to six hours of graduate work may be “double counted” toward both the baccalaureate and graduate degrees. Individual programs may allow additional hours at the graduate level to be substituted. In no case may more than 12 hours be double-counted.

Not all graduate programs have the early entry option. Inquiries should be addressed to the appropriate department or to the Graduate School.

GRADUATE STUDENT LIFE

New Graduate Student Orientation

The Graduate School conducts several University-wide orientation programs for new graduate and post-baccalaureate students during the course of the year. Information about the dates and times of these programs can be found on the Graduate School Website (http://www.uncc.edu/gradmiss/) and in the current Schedule of Courses. Information on the fall semester programs is also mailed, beginning in July, directly to new
students admitted for the fall semester. New Teaching Assistants are required to attend a specific orientation program prior to the fall semester as part of their assistantship contract.

The orientation programs offer information about various University programs and services for graduate students; provide publications, including the New Graduate Student Handbook, to serve as resource guides for students; host various content workshops on issues relevant to graduate education and graduate student life; and provide opportunities for students to ask specific questions.

Many of the individual graduate programs conduct discipline-specific orientation programs for their new graduate students. Degree students should contact their major department for information on programs that may be available.

Student Involvement
Students at UNC Charlotte are encouraged to participate in co-curricular activities. UNC Charlotte acknowledges that graduate students have many, many priorities in their lives. However, as with so many other aspects of one’s life, active involvement enhances the experience.

Graduate and Professional Student Government
The Graduate and Professional Student Government (GPSG) is the governing and primary organization for graduate students to present their needs to the University. The purpose of the Graduate and Professional Student Government (GPSG), according to the by-laws, is to serve as an appropriate voice on campus for graduate students, to meet the various needs of graduate students, and to establish a liaison between graduate faculty, graduate students, and the University.

In the spring of 1998, the Graduate Student Association successfully petitioned the student body through a referendum on the spring student body elections. The results of this referendum provided a significant change in the student body constitution and provided for the Graduate and Professional Student Government to become a separate governing body and representative organization for graduate students. In outlining the reasons for this separation, the GPSG cited the need for a GPSG office and the graduate student share of student activity fee support for graduate students. Each graduate program has the opportunity to be represented on the graduate senate. More information about this opportunity can be obtained from the Graduate Coordinator or the Assistant Dean for Graduate Student Affairs at 704-687-3375.

The GPSG Office is located in the Cone University Center, room 369, (704) 687-3231. The Web address is: http://www.uncc.edu/gpsg.

Graduate Student Organizations
There are a number of graduate student organizations directly associated with academic programs. They include:

- American Society of Precision Engineering
- Association of Biology Graduate Students
- Association of Chemistry Graduate Students
- English Graduate Student Association
- Gamma Theta Upsilon (Geography)
- Graduate History Association
- Graduate Nursing Organization
- Graduate Organization for Information Technology
- Graduate Psychology Association
- Graduate Social Work Club
- Masters of Architecture Student Society
- Masters of Business Administration Association
- Masters of Public Administration Students
- Mathematics Graduate Student Association

Information on each group is available from the academic program department. Some groups have information available on the Student Life Website at: http://www.uncc.edu/cone/clubs/.

Please see additional information on the various programs, offices and services at UNC Charlotte in the “Programs, Services and Facilities” section in the back of this catalog.

ADMISSION TO THE GRADUATE SCHOOL

Admissions Information
The University considers all applications without regard to race, color, sex, sexual orientation, national origin, disability, age or religion. All relevant factors are considered, with major emphasis being placed on the academic history of the applicant. The intent of the
University is to offer admission to those applicants whose credentials indicate a strong likelihood of success in their selected curricula.

The University reserves the right to withhold the admission of an applicant who fails to meet any of the requirements for admission, and meeting the minimum admission requirements does not guarantee admission to a graduate program. In addition, the University reserves the right to restrict enrollments when necessary because of budgetary or other constraints.

Application Materials
A separate application and processing fee must be submitted for each graduate program of study for which a student applies. Requests for application materials and additional information about graduate programs should be directed to one of the following.

Domestic Applicants Should Contact:
Office of Graduate Admissions
UNC Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001
World Wide Web:
http://www.uncc.edu/gradmiss
E-mail: gradadm@email.uncc.edu
Telephone: 704-687-3366
Fax: 704-687-3279

International Applicants Should Contact:
Office of International Admissions
UNC Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001
World Wide Web:
http://www.uncc.edu/intradmn
E-mail: intnlapp@email.uncc.edu
Telephone: 704-687-2694
Fax: 704-687-6340

Application Processing Fee
A non-refundable $35 processing fee (drawn on a U.S. bank) must accompany each application that is submitted. Acceptable forms of payment are a personal check or a money order made payable to UNC Charlotte. Please make sure that your name is clearly noted on the check or the money order as the intended applicant. Applications received without the required fee will remain on file, unprocessed, in our office for one year.

Application Deadlines
Students are encouraged to apply and to submit all supporting documents well in advance of the published deadlines. Some programs have earlier deadlines and may admit students only to a particular term. Please contact the department offering the program to which you are applying for specific deadline information. The University may alter the date for acceptance of applications without further notice in accordance with available resources and the enrollment limitation established by the North Carolina General Assembly.

Term of Entry: Application Should Be Completed By:
Fall July 1
Spring November 1
First or Second Summer Session April 1

Applications from students on non-immigrant visas are due by May 1 for the Fall Semester and October 1 for the Spring Semester.

Application Status
Applicants will be mailed a notice once the application for admission has been received. Applicants can monitor the status of their applications via the Graduate Admissions Web site: http://www.uncc.edu/gradmiss.

TYPES OF ADMISSION
(For Doctoral Degrees, Master's Degrees, and Graduate Certificates)

Full Standing
Applicants who meet the general requirements for admission to graduate study plus any additional requirements specified by the college or department of academic concentration for the degree sought will be admitted to full standing.

Provisional Standing
Applicants to graduate programs who have not yet completed their undergraduate degree will be provisionally admitted, pending the University’s receipt of final transcripts indicating the award of the baccalaureate degree. Students may be admitted provisionally for one semester only.

Deferment Policy
An applicant who is admitted to a graduate program of study who fails to enroll for the term to which he/she has been admitted is presumed to have withdrawn his/her application. The application may be reinstated if the request to do so is received within one year from the originally requested term of entry. This request should be in writing and addressed to the Office of Graduate Admissions at least six weeks prior to the term in which the applicant seeks to register. Students are eligible to update an application for admission for one year from the original term of application. Applications and supporting documents for persons who are admitted to a graduate program but do not enroll are maintained on file for one year from the original term of application. Note that some programs are selective and require an applicant’s credentials to be re-evaluated before deferring admission to a later term.
Policy on Updating Applications
Applicants who do not submit their materials in time to be considered for admission to the requested term are expected to notify the Office of Graduate Admissions to request consideration for admission to a subsequent term. Students are eligible to update an application for admission to a subsequent term for one year from the original term of application. Incomplete applications (including test score reports) are maintained on file for one year from the original term of application. Supporting credentials received without an application will be maintained on file in the Office of Graduate Admissions for one year. All applications for persons who are not admitted are maintained on file for one year.

GENERAL APPLICATION REQUIREMENTS FOR ADMISSION

Doctoral Degree Programs
In order to be considered for admission to a doctoral program, an applicant must have a bachelor’s degree from a regionally accredited college or university. Some programs admit baccalaureate students directly to the doctoral program, while others require applicants to have earned a master’s degree.

To be admitted after a master’s program, an applicant should have earned an overall grade point average of at least 3.5 (on a 4.0 scale) in the graduate degree program. To be admitted after a bachelor’s program, an applicant should have earned an overall GPA of at least 3.0, including a 3.0 for the last sixty hours of his/her first bachelor’s degree.

The application package must include:
1) An application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable. Materials submitted in support of this application cannot be returned.
2) Two official transcripts of all academic work attempted beyond high school. Transfer credit posted on the records of other institutions is unacceptable and official transcripts of these credits must be supplied.
3) Official agency reports of satisfactory test scores as specified in the section on graduate programs in this Catalog. GRE/GMAT scores are reportable from ETS for a period of five years from the date of the exam. Therefore, GRE/GMAT scores more than five years old are not accepted since they cannot be officially reported. Likewise, MAT scores more than five years old are not accepted. (Note: Test scores reported on official transcripts from other accredited institutions of higher education may be acceptable.)
4) At least three evaluations from persons familiar with the applicant’s personal and professional qualifications.
5) An essay (Statement of Purpose) describing the applicant’s experience and objective in undertaking graduate study (Note: Some academic programs have specific items for the applicant to address in the Statement of Purpose; please contact the Office of Graduate Admissions or the academic department for specific requirements).

International Students should see the Additional Admission Requirements for International Applicants section of the Catalog for additional requirements.

Note:
Applicants with records of high quality who do not fulfill these requirements should discuss with the graduate program coordinator other factors that may have a bearing on admission. Some programs have higher standards or additional admission requirements. Additionally, there may be prerequisites for certain doctoral programs. Students should consult the graduate coordinator for the doctoral program to identify prerequisites. A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte.

Master’s Degree Programs
The applicant must possess a bachelor’s degree, or its equivalent, from a regionally accredited college or university, and must have attained an overall grade point average of at least 2.75 (based on a 4.0 scale), including a 3.0 for the last 60 hours of his/her first bachelor’s degree. If the applicant has earned post-baccalaureate credit, those grades will be taken into consideration separately.

The application package must include:
1) Application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable. Materials submitted in support of this application cannot be returned.
2) Two official transcripts of all previous academic work attempted beyond high school. Transfer credit posted on the records of other institutions is unacceptable and official transcripts of these credits must be supplied.
3) Official agency reports of satisfactory test scores as specified in the section on graduate programs in this Catalog. GRE/GMAT scores are reportable from ETS for a period of five years from the date of the exam. Therefore, GRE/GMAT scores more than five years old are not accepted since they cannot be officially reported. Likewise, MAT scores more than five years old are not accepted.
Graduate Certificate Programs
The applicant must possess a bachelor’s degree, or its equivalent, from a regionally accredited college or university. The application package must include:

1) An application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable.

2) An overall grade point average of at least 2.75 (based on a 4.0 scale), including a 3.0 or better for the last 60 hours of work completed for the first baccalaureate degree. If the applicant has earned a post-baccalaureate degree, those grades will be taken into consideration.

3) Two official transcripts from each institution where academic work was attempted beyond high school.

Some programs may also require:
- Standardized test scores, a personal statement (Statement of Purpose) outlining why the applicant seeks admission to the program, and additional admission requirements as specified in program descriptions.

Note:
There may be prerequisites for a graduate certificate program. Students should consult the coordinator for the graduate certificate program to identify prerequisites. Admission to a graduate certificate program does not ensure admission into a graduate degree program. A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte.

Post-Baccalaureate Study
The applicant must possess a bachelor’s degree, or its equivalent, from a regionally accredited college or university. The application consists of a completed application form submitted to the Office of Graduate Admissions, accompanied by a $35 application fee which is neither deductible nor refundable.

Note:
A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte. A post-baccalaureate student who subsequently applies and is admitted to full standing in a degree program may, with the permission of his/her advisor and the Graduate School, apply a maximum of six credit hours acceptably completed in the post-baccalaureate status toward a degree. Foreign nationals must contact the Office of International Admissions before applying for this classification.

Additional Admission Requirements for International Applicants

1) Submission of official scores on the Test of English as a Foreign Language (TOEFL) or the Michigan Test (MELAB), if the applicant is from a non-English-speaking country. Required is either a minimum score of 550 on the TOEFL, a minimum score of 220 on the new computer based TOEFL, or a minimum score of 85 percent on the MELAB.

2) A Statement of Financial Responsibility showing the applicant’s financial resources during his/her stay in the United States.

Note:
All applicants submitting transcripts from non-U.S. educational institutions should note that some bachelor’s degrees given by non-U.S. schools are not equivalent to the U.S. bachelor’s degree. Recipients of these degrees are not eligible for graduate study at UNC Charlotte.

An I-20 Form will not be issued until the applicant has been admitted to a degree program and financial responsibility has been proven.

Test Information
Applicants should have their test scores sent directly from the testing agency to the Office of Graduate Admissions (not to the department in which they wish to study). UNC Charlotte’s institution code for the GRE and GMAT is 5105. The UNC Charlotte school code for the MAT is 1370.

Graduate Record Examination (GRE)
The GRE measures verbal, quantitative, and analytical skills that have been acquired over a long period of time and are not related to any specific field of study. The GRE is primarily a computer-based test and is offered year-round at test centers (such as Prometric Testing...
The Graduate School

Centers) worldwide. To obtain additional information about the GRE, visit the GRE website at http://www.gre.org or call 1-800-GRE-CALL. Please call your local testing center to schedule a test. The number for the Prometric Testing Center in Charlotte is 704-364-7758.

**Miller Analogies Test (MAT)**
The Psychological Testing Corporation administers the MAT. To schedule a test, please call 1-800-228-0752. The Counseling Center at UNC Charlotte at 704-687-2105 also administers the MAT.

**Graduate Management Admission Test (GMAT)**
Prometric Testing Centers administers the computer-adaptive GMAT several times per week throughout the U.S. Please call your local Prometric Testing Center to schedule a test. The number for the Prometric Testing Center in Charlotte is 704-364-7758. To obtain additional information about the GMAT, visit the GMAT Website at http://www.gmat.org or call 1-800-GMAT-NOW.

**Test of English as a Foreign Language (TOEFL)**
The TOEFL is offered at the Prometric Testing Center. Please call your local Prometric Testing Center to schedule a test (in Charlotte, call 704-364-7758). To obtain additional information about the TOEFL, visit the TOEFL Website at http://www.toefl.org.
Student Expenses and Fee Payment
Charges for tuition and fees vary according to the student's status as a resident or nonresident of North Carolina. A nonresident student pays a higher rate of tuition than a legal resident.

The University reserves the right, with the approval of proper authorities, to make changes in tuition and fees at any time. The University also reserves the right to correct any clerical errors on a student's account.

Student Expenses
Graduate students taking nine or more semester hours during a regular semester will be charged full tuition and fees. Students taking fewer than the nine hours for graduate study will be charged a prorated portion of tuition and fees as specified in the fee schedules in this Catalog.

Fee Payment
Tuition and fees are due and payable by the date specified on the bill. Advance registration billing and due dates of fees vary with the term. Checks and money orders should be made payable to UNC Charlotte. Visa and MasterCard are accepted.

Returned Check Policy
If a check is returned by the bank, a letter is sent to the maker indicating that a penalty of $20 has been assessed and the account must be settled within 10 working days or the check will be considered to be a bad check and be processed accordingly. A hold will be placed on the student's record until the bad check is covered and the penalty is paid.

A student who pays a previous balance with a check in order to have a registration hold flag lifted will have their registration cancelled if the check is returned by the bank for any reason.

Residence Status For Tuition Purposes
Tuition charges are based upon classification of a student as a resident or a nonresident for tuition purposes. UNC Charlotte shall determine whether a student is a resident or a nonresident for tuition purposes in accordance with North Carolina General Statutes that are summarized below.

Residence. Generally, in order to qualify as a resident for tuition purposes, a person must be a legal resident of North Carolina AND must have been a legal resident of North Carolina for at least 12 months immediately prior to classification as a resident for tuition purposes. Legal residence is accomplished by maintaining a bona fide domicile of indefinite duration as opposed to maintaining a mere temporary residence incident to enrollment at an institution of higher education.

Initiative and Proof of Status. A student is responsible for seeking classification as a resident for tuition purposes. A student must (1) provide all of the information UNC Charlotte requires for consideration of residence classification and (2) establish facts that justify classification as a resident for tuition purposes.

Parents' Domicile. If a student has living parent(s) or a court-appointed guardian, the legal residence of the parent(s) or guardian is primary proof of the legal residence of the student. This primary proof of a student's legal residence may be supported or rebutted by other information.

If a student's parents are domiciled outside of North Carolina, their domicile will not be primary proof of the student's legal residence if the student has lived in North Carolina during the five years preceding enrollment or re-registration at UNC Charlotte.

Effect of Marriage. If husband and wife are legal residents of North Carolina and one of them has been a legal resident longer than the other, the longer duration may be claimed by either spouse in meeting the 12-month durational requirement for classification as a resident for tuition purposes.

Military Personnel. A North Carolinian who serves outside the State in the armed forces does not lose North Carolina domicile and thus North Carolina legal residence simply by reason of such service. Students in the military may prove retention or establishment of legal residence by reference to residentiary acts accompanied by residentiary intent.

In addition, North Carolina General Statutes provide tuition rate benefits to certain military personnel and their dependents who do not otherwise qualify for the in-state tuition rate. Members of the armed services, while stationed in and concurrently living in North Carolina, may be charged a tuition rate lower than the out-of-state tuition rate to the extent that the total of entitlements for applicable tuition costs available from the federal government, plus certain amounts calculated by reference to a North Carolina statutory formula, is a sum less than the out-of-state tuition rate for the applicable enrollment.

A dependent relative of a service member stationed in North Carolina shall be charged the in-state tuition rate while the dependent relative is living in North Carolina with the service member. Under this provision, the
dependent relative must comply with any applicable requirements of the Selective Service System.

Tuition benefits based on military service may be enjoyed only if requirements for admission to UNC Charlotte have been met. The military service tuition statute does not qualify a person for or provide the basis for receiving derivative benefits under other tuition statutes.

**Grace Period.** If a student (1) is a legal resident of North Carolina, (2) has consequently been classified a resident for tuition purposes, and (3) has subsequently lost North Carolina legal residence while enrolled at UNC Charlotte, the student may continue to enjoy the in-state tuition rate for a grace period of 12 months measured from the date the student lost his or her status as a legal resident. If the 12 month grace period ends during an academic term in which the student is enrolled at UNC Charlotte, the grace period extends to the end of that term. Marriage to one domiciled outside of North Carolina does not, by itself, cause loss of legal residence, marking the beginning of the grace period.

**Lost but Regained Legal Residence.** If a student ceases enrollment at or graduates from UNC Charlotte while classified a resident for tuition purposes and then abandons and reestablishes North Carolina legal residence within a 12-month period, that student shall be permitted to re-enroll at UNC Charlotte as a resident for tuition purposes without meeting the 12-month durational requirement. Under this provision, the student maintains the reestablished legal residence through the beginning of the academic term for which in-state tuition status is sought. A student may receive the benefit of this provision only once.

**Change of Status.** A student accepted for initial enrollment at UNC Charlotte or permitted to re-enroll following an absence from the institutional program that involved a formal withdrawal from enrollment must be classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual enrollment. A residence status classification once assigned (and finalized pursuant to any appeal properly taken) may be changed thereafter (with corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic year.

**Transfer Students.** When a student transfers from one institution of higher education to another, he or she is treated as a new student and must be assigned an initial residence classification for tuition purposes.

**Appeal Procedure.** Graduate student appeals relating to in-state or out-of-state residence for tuition purposes should be submitted in writing to the Residency Coordinator, c/o The Graduate School and must include your name, address, telephone number, and student I.D. number. Detailed information is available on line at http://www.uncc.edu/gradmiss.

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**TUITION AND FEES PER SEMESTER**

The University reserves the right, with the approval of the appropriate authorities, to make changes in tuition and/or fees at any time. Tuition and fee rates for the 2002-2004 time period were not available at the time this Catalog was printed. The following tuition and fee rates and special fees are the rates charged for the Spring 2002 term.

| GRADUATE RATES |
|-----------------|-----------------|
| Resident        | Non-Resident    |
| 1 Hr. (Thesis or Dissertation only) | $73.00 | $483.00 |
| 1-2 Hrs.        | 324.00          | 1369.75 |
| 3-5 Hrs.        | 509.25          | 2601.00 |
| 6-8 Hrs.        | 830.50          | 3968.00 |
| 9 or more Hrs.  | 1263.00         | 5446.50 |

Post-baccalaureate students who are taking only undergraduate courses will pay tuition and fees at the undergraduate rate. Post-baccalaureate students taking one or more graduate credit courses will pay tuition and fees at the graduate rate for all courses.

The following Student Activities Fees are included in the full-time tuition and fee amounts. Fees per semester are:

- Educational and Technology .................................................. $44.50
- Student Activity Facility .................................................. 65.00
- Student Activity Center Operations ................................. 55.50
- Cone Center Facilities .................................................. 14.00
- Cone Center Operating .................................................. 62.50
- Student Activity .......................................................... 20.50
- Physical Education Facilities Maintenance ....................... 5.50
- Physical Education Facility ............................................. 5.00
- Health Center .............................................................. 60.00
- Athletic ................................................................. 150.00
- Intramural ................................................................. 18.50
- Student I.D. ............................................................... 2.00

Total fees per full-time student, per semester: $503.00

**Housing Per Semester**

Shared Residence Hall space is not available to married students and/or their family members. There are apartments for non-married graduate students on campus. The following 2001-2002 prices and plans are subject to change.

- Apartment .............................................................. $1,594.00 to $1,824.00
- Residence Hall – Double Room ................................. $1,248.00
Residence Hall – Single Room (if available) .................. $1,842.00
Suite ................................................................. $1,494.00 to $1,814.00

Dining Services Per Semester
The following 2001-2002 prices and plans are subject to change. Commuters or UNC Charlotte apartment residents may purchase any of the plans listed below:

14 meals per week with $200 declining balance ........................................ $1,025.00
12 meals per week with $300 declining balance ........................................ $1,200.00
10 meals per week with $400 declining balance ........................................ $1,200.00
150 block plan with $100 declining balance .............................................. $965.00
Declining Balance Account ....................... $720.00 or $1,025.00
125 block plan with $175 declining balance ...... $845.00
Declining balance account ................................................. $500.00

Any student, faculty or staff member may purchase or add additional Optional Declining Balance funds to their 49er ID card. Optional Declining Balance can be purchased directly from the food service contractor, Sodexo Management Services, located in the ID Card office in the Cone University Center. New Optional Declining Balance accounts require a minimum purchase of $25 and may be paid in cash, by check, or charged to Visa or MasterCard.

Special Assessments
During 2001-02, the following special assessments were charged to cover the cost of supplies or special materials (per semester, except where indicated otherwise):
Loona Scuba Diving (HPED 2219) ........................................ $60.00
Advanced Scuba Diving (HPED 2220) ....................... $35.00
Applied Music Fee (1 credit hour) ......................... $45.00
Applied Music Fee (2 credit hours) ..................... $90.00
College of Engineering Student Fee
1-7 hours (per academic year) ................... $76.00
8 hours or more (per academic year) ...... $150.00
College of Information Technology student fee
1-7 hours (per academic year) ................... $76.00
8 hours or more (per academic year) ...... $150.00
Teacher Licensure Fee ............................................. $30.00
Cooperative Education Fee ................................. $75.00
Architecture Major General Student Fee
(per academic year) ........................................ $80.00
International Student Fee (per academic year) .... $100.00
Administrative Cancellation Fee ......................... $75.00

Application Fee. A $35 application fee must be submitted with the application for admission. The fee is not deductable and is not refundable.

Housing Deposit. Admission to UNC Charlotte does not guarantee residence hall space. Arrangements for on-campus housing are made, after admission, with the Associate Vice Chancellor for Housing and Residence Life. Residence hall space is not available to married students or their families.

All housing applications must be submitted with a $100 deposit. The deposit is refundable, minus any outstanding damages and charges, upon departure from the residence life system. No deposits for fall semester are refunded after May 14. No deposits for spring semester are refunded after November 24. All students living in the residence halls will have an $11 Residence Hall Association fee included in their semester housing charges.

Student Activities Fee. A part of the general fee provides students with a program of cultural, recreational, and entertainment activities. It pays for admission to many athletic contests, dramatic productions, activities sponsored by the University Program Board, social and entertainment functions, and for subscriptions to the campus newspaper and literary magazine. Student Activity fees also provide financial support to the Graduate and Professional Student Government and many recognized graduate student organizations.

Graduation Fee. Each member of the graduating class is automatically charged a graduation fee of $35 at the time he/she applies for the degree. This fee includes the cost of the diploma and the cap and gown. No reduction of the fee is allowed for those receiving degrees in Absentia. The cost of renting a hood is in addition to the $35 charge.

Credit By Examination Fee. Fees for credit by examination are as follows: A written examination for a course will require a fee of $15. A laboratory examination requiring the arrangement of such things as laboratory materials will require a fee of $25. A combination of a laboratory and written examination will require a fee of $30.

Motor Vehicle Registration Fees
Students attending UNC Charlotte are required to register their motor vehicle(s) in order to park on campus; there is no free parking. Vehicle registration for fall and spring semesters begins two weeks prior to the first day of classes. Students may request parking permits to be mailed directly to them (fall term only) by contacting Parking Services at least one month prior to the beginning of classes (704-687-4285). Payment must be received before the permit is mailed. Enforcement begins the first Monday after classes begin in the fall and spring semester and the first day of class in the summer terms. Two categories of permits are issued: Resident (for students living on campus) and Commuter (for students living off campus).
Permits sold in August are good for one year. Students who graduate in December may return their parking permit for a partial refund. The price of the permit is the same for faculty, staff and students. In 2000-2001, permits cost $175 but this cost is subject to change. Parking Services receives no state funding; therefore, parking fees are used to defray construction and operating expenses.

Night permits, valid only after 3:00 p.m., are sold at a reduced rate using the same schedule as the regular student permits. Students with night permits who come on campus before that time must park and pay at the meters or in visitors' spaces.

**Penalties for Parking Violations.** Violators of University parking regulations are subject to monetary penalties ranging from $5 to $100, depending on the seriousness of the violation. Copies of parking regulations are distributed with the parking permit. If a citation is not paid or appealed within 10 days, the penalty will be applied to the student's account with the University. Subsequent registration may be withheld for non-payment. Parking citations are issued 24 hours a day. Decals and meters are enforced from 8:00 a.m. until midnight, Monday through Thursday and from 8:00 a.m. until 3:00 p.m. on Friday.

Questions concerning parking on campus should be directed to Parking Services, which is open from 8:00 a.m. until 5:00 p.m. Monday through Friday. Emergency situations and questions at other times should be directed to 704-687-2200.

**Refunds**

**Tuition and Fees Refunds**

A student who officially withdraws from the University in the fall or spring semester will receive a refund as follows:

<table>
<thead>
<tr>
<th>Fall or Spring Semester</th>
<th>% of Tuition and Fees Refunded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1st Class Day</td>
<td>100%</td>
</tr>
<tr>
<td>Week 1</td>
<td>100% minus $25 withdrawal fee</td>
</tr>
<tr>
<td>Week 2</td>
<td>100% minus $75 withdrawal fee</td>
</tr>
<tr>
<td>Week 3</td>
<td>80%</td>
</tr>
<tr>
<td>Week 4</td>
<td>75%</td>
</tr>
<tr>
<td>Week 5</td>
<td>70%</td>
</tr>
<tr>
<td>Week 6</td>
<td>60%</td>
</tr>
<tr>
<td>Week 7</td>
<td>55%</td>
</tr>
<tr>
<td>Week 8</td>
<td>50%</td>
</tr>
<tr>
<td>Week 9</td>
<td>40%</td>
</tr>
<tr>
<td>After Week 9</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Summer School:** A student who officially withdraws from the University during summer school will receive a refund as follows:

<table>
<thead>
<tr>
<th>5 and 10 Week Summer Terms</th>
<th>% of Tuition and Fees Refunded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1st Class Day</td>
<td>100%</td>
</tr>
<tr>
<td>Day 1 - 2</td>
<td>100% minus $25 registration fee</td>
</tr>
<tr>
<td>Day 3 - 5</td>
<td>80%</td>
</tr>
<tr>
<td>Day 6 - 7</td>
<td>70%</td>
</tr>
<tr>
<td>Day 8 - 10</td>
<td>60%</td>
</tr>
<tr>
<td>Day 11 - 12</td>
<td>50%</td>
</tr>
<tr>
<td>Day 13 - 15</td>
<td>40%</td>
</tr>
<tr>
<td>After Day 15</td>
<td>0%</td>
</tr>
</tbody>
</table>

Students registered for short courses and institutes **only** during summer school will receive refunds upon withdrawal from the University as follows:

<table>
<thead>
<tr>
<th>Special Term</th>
<th>% of Tuition and Fees Refunded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1st Class Day</td>
<td>100%</td>
</tr>
<tr>
<td>First Class Day</td>
<td>100% minus $25 withdrawal fee</td>
</tr>
<tr>
<td>Second Class Day</td>
<td>50%</td>
</tr>
<tr>
<td>After Second Class Day</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Exception:** Charges are refundable by administrative action on a prorated basis for the unexpired portion of the term for the following reasons: death of the student, withdrawal for adequate medical reason as certified by the University Student Health Center or family doctor, death in the immediate family that necessitates student withdrawal, and dismissal or suspension from school. Immediate family is defined as wife, husband, parent, child, brother, sister, grandparent, and grandchildren and includes step, half, and in-law relationships. Appropriate documentation must be submitted to the Registrar.

No refunds will be given to students who are withdrawn by administrative action for failure to comply with the North Carolina immunization laws.

**Housing Refunds**

The rental period for academic year contracts is for the entire academic year (fall and spring semesters) continuing until the end of the spring semester, regardless of occupancy date after the fall semester begins. The housing and dining contract binds the student and/or guarantor to the full amount of charges for
housing for the academic year. Contact the Department of Housing for specific cancellation charges for canceling a signed housing prior to and after assuming residence.

Appeal Procedure
Appeals about tuition and dining refunds should be submitted in writing to Student Accounts, UNC Charlotte, Charlotte, NC 28223. Appeals about housing refunds should be submitted to Department of Housing, UNC Charlotte, Charlotte, NC 28223. Appeals are heard on a monthly schedule by the Tuition, Housing, and Dining Appeal Committee.

FINANCIAL AID
UNC Charlotte administers financial aid without regard to race, color, national origin, religion, sex, sexual orientation, age, or disability.

The University offers a comprehensive program of student financial aid (scholarships, fellowships, grants, loans, and part-time employment) to assist both graduate and undergraduate students in meeting educational expenses. Reasonable educational expenses include tuition and fees, room and board, books, supplies, transportation, miscellaneous personal expenses, and expenses related to maintenance of a student’s dependents.

Eligibility
The programs of student financial aid are administered according to a nationally accepted policy that the family, meaning parents (or those acting in place of parents) and/or spouse, is responsible for a student's educational expenses. Therefore, eligibility for financial aid will be determined by a comparison of a budget (educational expenses as defined above) for the period of attendance with what the student's family can reasonably be expected to contribute.

A financial aid applicant will be considered for available assistance for which he/she is eligible if the student:
1) Completes the application process and related forms only after thoroughly reading all instructions.
2) Completes the admission application process and is accepted for enrollment at UNC Charlotte.
3) Is working toward a degree and not simply taking courses.

Application Process
To apply for the following programs, a student must complete the Free Application for Federal Student Aid using the instructions and mailing address provided with the form. The form is available in the UNC Charlotte Financial Aid Office.

Renewal Process
Renewal of financial aid is based upon a student's making satisfactory academic progress. The Free Application for Federal Student Aid is required each year that a student applies for financial aid.

Financial Aid Programs
Loans
Federal Perkins Loan--Applicants may request amounts based on financial need. An aggregate total of $30,000 is available for graduate study. The interest rate is five percent with repayment beginning nine months after graduation.

Federal Stafford Loans--Graduate students may borrow up to $8,500 per year. Independent students may be eligible to receive additional loan amounts. The interest rate is variable, and repayment begins six months after the borrower ceases to be a student.

Short-Term Emergency Loans--Students may borrow up to $150 for unanticipated expenses that occur during the semester and up to $1,000 for tuition expenses. The loans have a $1 service charge, but no interest is charged. Loans must be repaid within 30 to 60 days. Funds for these loans are provided by private donation.

Grants
North Carolina Minority Presence Grant Program--The University of North Carolina Board of Governors provides funding to historically white and historically black institutions to aid them in recruiting financially needy North Carolina students who would be minority presence students at the respective institutions by enabling the institutions to offer relatively more aid for minority presence students in the form of grants rather than loans. Minority Presence Grants typically range up to $1,000. There are a limited number of awards available to graduate students.

Non-Resident Tuition Differential Grant--This grant is available in selected graduate programs to non-residents of North Carolina. To be eligible, a student must be admitted to full standing in a graduate program, and must hold an assistantship.

North Carolina Graduate Grant--There are a limited number of tuition scholarships available for North Carolina residents to assist with tuition and fees. These are for students of high merit who have also received a graduate assistantship. Students should contact their graduate coordinator about application procedures.
UNC Charlotte Grants—UNC Charlotte administers several other grant programs funded by the State of North Carolina and requires North Carolina residency for consideration. These are available to both graduate and undergraduate students who apply by the established priority date of April 1.

Graduate Assistantships
Approximately one-half of the University’s full-time graduate students hold graduate assistantships which provide them with financial aid and valuable experience in administration, teaching, and research related to their academic endeavors.

To be eligible for an assistantship, a student must be admitted to full standing in a graduate program and must have had an undergraduate GPA of at least 2.75 with a 3.0 or better for the junior and senior years; or must have completed at least six hours of graduate work with a GPA of 3.0 or better.

To retain their appointments, graduate assistants must maintain appropriate enrollment, register for at least 6 graduate-level hours each semester, make satisfactory progress toward their degrees, maintain a 3.0 GPA and perform their assigned duties satisfactorily. It is expected that graduate assistants will not engage in other employment during the term of their assistantship.

Assistantships are available in most graduate degree programs and through some administrative offices. To apply, students should complete the Application for Graduate Assistantship (available from the Graduate School) and submit it to the degree program or administrative office in the winter preceding the academic year for which the assistantship is sought.

Fellowships/Scholarships

John Paul Lucas, Jr. Scholarship
This is an award given each spring semester to a student who has been teaching and wishes to pursue a graduate degree in English in the College of Arts and Sciences or College of Education.

The Robert J. Mundt Memorial Scholarship for International Study
Stipends are available to defray the costs associated with a study abroad experience. All full-time graduate and undergraduate UNC Charlotte students are eligible. Applications are available in the Office of Education Abroad in Room 114 Denny.

Giles and Stones Fellowships
Stipends are available to selected doctoral students from donations made to the University by the Giles and Stone families. These awards are usually given in addition to a graduate assistantship.

The Zonta Club
The Zonta Club award is given annually to an undergraduate or graduate student who is continuing a university education after considerable time away from formal education. This award covers the cost of one-year’s in-state tuition.

National Fellowships
These awards are made to an individual rather than to the University. Recipients are chosen through competitions expressive of the terms of each award. Some examples of these awards are listed below. Contact the graduate program coordinator to discuss available fellowship programs in a specific field.

- National Science Foundation (NSF) Graduate Research Fellowship
- Ford Foundation Predoctoral Fellowship for Minorities
- Department of Defense National Defense Science and Engineering Graduate Fellowship (DOD NDSEG)
- Department of Energy Computational Science Graduate Fellowship
- NASA Graduate Student Researchers Program – Underrepresented Minority Focus Award
- National Consortium for Graduate Degrees for Minorities in Engineering Inc. (GEM) Fellowship
- National Physical Science Consortium: Graduate Fellowships for Minorities and Women in the Physical Sciences

In addition to the fellowships and scholarships mentioned above, a number of the graduate programs have scholarships and/or assistantships available. Please contact the individual units for specific information.

Employment On-Campus
The Student Employment Office assists students in locating work on campus. The University participates in the federal Work-Study Program and attempts to match students with jobs related to their academic interests.

Part-Time Employment Off-Campus
The University Career Center assists students in obtaining part-time employment off-campus. Job listings and assistance are available in the Atkins Building. Students are encouraged also to participate in career related experiences such as co-op, internships, and 49erships, which can be arranged through the University Career Center..

Education for the Vocationally Handicapped
Students who have suffered a disability that renders them vocationally handicapped are eligible for aid provided by the North Carolina State Division of Vocational Rehabilitation. This aid takes the form of services that include vocational counseling and guidance and placement. Payment of expenses such as training, medical
treatment, room and board, books, fees, and tuition may be available. A vocational rehabilitation officer is available in Charlotte for interviewing applicants. Appointments may be made by contacting Vocational Rehabilitation Services located at 401 S. Independence Blvd., 704-342-5049.

Veterans Benefits

UNC Charlotte’s Veterans Service Office (VSO), located in the Office of the Registrar, works with the Veterans Administration to assist in administering the various programs of benefit to veterans or eligible relatives of veterans. The VSO Certifying Official certifies enrollment and transmits necessary credentials and information to the proper Veterans Administrative Office.

Admission to the University should be obtained before the student makes application for veteran's benefits. Applicants must be accepted into a degree program to receive benefits.

In order to be eligible for the full monthly allowance under any of the above laws, an undergraduate student must be enrolled for 12 or more semester hours and a graduate student must be enrolled for nine or more semester hours. Those enrolled on a part-time basis will be eligible for part-time compensation. Students are responsible for reporting any change in enrollment status to the VSO Certifying Official.

Children of Veterans. The North Carolina Department of Veterans Affairs awards scholarships for the children of certain deceased or disabled veterans. Those awarded "full" scholarships are entitled to tuition, mandatory fees, board allowance, and room allowance; those awarded "limited" scholarships are entitled to tuition and mandatory fees. All inquiries should be referred to the North Carolina Division of Veterans Affairs, Albermarle Building, Suite 1065, 325 North Salisbury St., Raleigh, NC 27601, telephone (919) 733-3851.

Before the time of registration, each eligible student who wishes to enter the University should: (1) apply for admission following University procedures and (2) apply for a scholarship award to the North Carolina Department of Veterans Affairs.
ACADEMIC REGULATIONS AND DEGREE REQUIREMENTS

Student Responsibility

Each student is responsible for the proper completion of his or her academic program, for familiarity with the University Graduate Catalog (and where appropriate, the University Undergraduate Catalog), for maintaining the grade average required, and for meeting all other degree requirements. The advisor will counsel, but the final responsibility remains that of the student.

A student is required to have knowledge of and observe all regulations pertaining to campus life and student deportment. The University has enacted two codes of student responsibility: The UNC Charlotte Code of Student Academic Integrity and The UNC Charlotte Code of Student Responsibility which are summarized in this Catalog. As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of UNC Charlotte community cooperation and make those benefits possible.

Each student is responsible for maintaining communication with the University and keeping on file with the Registrar's Office at all times a current address, including zip code, and telephone number.

Each student, while associated with the University, is expected to participate in campus and community life in a manner that will reflect credit upon the student and the University.

Catalog Policies

The Catalog is not an irrevocable contract. Regulations published in it are subject to change by the University at any time without notice. University regulations are policy statements to guide students, faculty, and administrative officers in achieving the goals of the institution. Necessary interpretations of these policies will be made by the appropriate authorities with the interest of the students and the institution in mind. Students are encouraged to consult an advisor if they have questions about the application of any policy.

Each new edition of the catalog becomes effective at the opening of the fall semester following its publication.

Exceptions to these policies may be necessitated by changes in course offerings, degree programs or by action of authorities higher than the University. In that event, every effort will be made to avoid penalizing the student.

Course Load

An appropriate course load is dependent upon two factors: the scholastic ability of the student as reflected by his/her academic history and the time available for study. A course load of nine semester hours constitutes a normal full semester program for a graduate student. This is lower than the normal undergraduate load because of the extensive reading, independent thinking and individual research required of graduate students. Generally, graduate students should not register for more than 12 semester hours during a semester.

A graduate assistant must register for at least six graduate-level semester hours during each semester in which an assistantship is awarded.

Registration

The Registrar is responsible for the management of the registration process by which students enroll in classes. Registration policies and procedures for each term are described in the Schedule of Classes for that term. Also see the Registrar's web page at: http://www.uncc.edu/registrar.

Through the registration process, students assume academic and financial responsibility for the classes in which they enroll. They are relieved of these responsibilities only by formally terminating enrollment by dropping or withdrawing from class in accordance with procedures and deadlines specified in the Schedule of Classes each term.

Registration Deadlines

University policies determine when students may enroll or adjust their enrollment in classes. Deadlines for the spring and fall semesters are shown below. (Deadlines for summer sessions are approximately proportional based on the length of the session.)

- **Register** for classes through the eighth instructional day of the semester.
- **Drop a class without record** (and remain enrolled in other classes) through the sixth instructional day of the semester.
- **Withdraw from the University without record** through the sixth instructional day of the semester.
- **Drop a class with grade of W recorded** (and remain enrolled in other classes) through the sixth week of classes in the semester. No student will be allowed to drop a course after this deadline unless there are extenuating circumstances recognized by the University.
Withdraw from the University with grade of \textit{W} recorded after the sixth instructional day through the third week prior to the last day of classes of the semester. No student will be allowed to withdraw after this deadline unless there are extenuating circumstances recognized by the University. (See the Termination of Enrollment section of this Catalog.)

\section*{Prerequisites and Permits}
Credit will be awarded only to students who are properly registered. All students, including visitors and non-degree students, are required to meet course prerequisites and to obtain the required permissions to enroll in courses specified in the \textit{Schedule of Classes}.

\section*{Auditors}
With the consent of the instructor, a student may register as an \textit{auditor} for any class in which space is available. Fees and procedures for this non-credit enrollment are the same as those for a credit enrollment.

No student will be allowed to change the designation of a course from audit to credit or from credit to audit after the eighth instructional day of a semester (or a proportional period for summer school).

The participation of auditors in class discussion and in tests or examinations is optional with the instructor. Auditors receive no University credit, but they are expected to attend class regularly. A formal record of the audit on the student's transcript is entered at the discretion of the instructor at the end of the course. The procedure for adding or dropping an audit course is the same as for credit enrollments.

\section*{Dual Undergraduate and Graduate Registration}
Undergraduate students at UNC Charlotte who are required to take fewer than 12 semester hours of undergraduate work to fulfill all requirements for the bachelor’s degree may be allowed during their final semester to enroll in certain courses for the purpose of obtaining graduate credit. Authorization for dual undergraduate/graduate registration may be obtained by submitting to the Graduate School a Special Request Form approved by the student’s undergraduate academic advisor, the instructor(s) of the graduate course(s), and the dean(s) of the college(s) offering the graduate course(s), accompanied by the regular application for admission to graduate study and supporting credentials. The total hours to be carried in this status shall not exceed 12 hours, of which no more than nine may be for graduate credit. On the basis of work attempted prior to the final semester, such student must meet the grade point criteria for admission to a graduate degree program at the University. No course for which credit is applied to an undergraduate degree may receive graduate credit. Permission to take graduate courses under dual registration does not constitute admission to any graduate degree program at the University.

\section*{Inter-Institutional Registration}
An inter-institutional registration program is available for a limited number of undergraduate and graduate students with the University of North Carolina at Greensboro, North Carolina State University, University of North Carolina at Chapel Hill, Duke University, NC Central University, and NC A&T University. The registration process is initiated in the Registrar's Office and requires the approval of the student's college dean.

\section*{Continuous Registration}
Students in graduate degree programs are required to maintain continuous registration (fall and spring semesters) for thesis, dissertation, project, or directed study until work is completed. Students are not required to enroll in any summer term unless they are using campus facilities or they are completing degree requirements in that term. Continuous registration begins the semester approval for his/her thesis, dissertation, project, or directed study topic is received. Approval of this topic is documented on the "Petition for Topic Approval" form which is filed by the student with the Graduate School. Students who exceed the required number of hours without completing their work should register for "7999" or "9999" (graduate residence) until the thesis, dissertation, project, or directed study is completed.

Students who have completed their course work and the number of thesis/dissertation hours for credit required in their graduate degree program must take one of two actions:

1) Students who will continue to use University resources in completing their degrees must enroll in and pay tuition and fees for not less than one hour of graduate residence credit each semester.

2) Students who will not use University resources should apply for a leave of absence. Students choosing this option must file a formal petition for a leave of absence that states they will not use University resources during the leave period. If the leave of absence extends beyond two calendar years, the student must re-apply for active status in the graduate program.

Students must be enrolled during the term (semester or summer) in which they graduate from the university.

\section*{Change of Degree Program}
To change from one degree program to another, a graduate student must fill out the application for admission to the new program, pay the $35 application fee, and provide supporting documentation as specified in this Catalog. Contact the Office of Graduate Admissions for additional information.

\section*{Termination of Enrollment}
Drop
A student may terminate enrollment in a course but continue enrollment in other courses by following the
procedure to drop a course specified in the Schedule of Classes. A student enrolled in only one course must withdraw officially from the University to drop the course.

Withdrawal from the University
Any student voluntarily leaving the University before the close of the term must withdraw officially. A student initiates the withdrawal procedure and files the completed form at the Registrar's Office in person or by letter. A withdrawal is effective when the form or letter is received by the Registrar's Office. A student who withdraws from the University after the sixth instructional day will receive the grade of \( W \) for all courses in progress. No student will be allowed to withdraw within two weeks prior to the last day of class (or as close to half the summer term as possible) unless there are extenuating circumstances such as serious illness recognized by the University and approved by the student's dean.

Any student who leaves the University before the close of a term without withdrawing officially will receive a failing or unsatisfactory grade (\( U \) for graduate credit) in each course for which he/she is registered. A graduate student who receives a \( U \) is automatically suspended from the University and must appeal to the Dean of the Graduate School for reinstatement.

Attendance Policy
Each instructor determines the regulations for class attendance. Students are expected to attend punctually all scheduled sessions in the courses for which they are registered and are responsible for completing the work from all class sessions.

Absences from class may be excused by the instructor for such reasons as personal illness, religious holidays, or participating as an authorized University representative in an out-of-town event. Whenever possible, students are expected to seek the permission of the instructor prior to absences.

Grading Policies
Instructors assign grades on the basis of their evaluation of the academic performance of each student enrolled in their courses. At the end of the term, the grades are reported to the Registrar's Office which is responsible for maintaining student academic records and reporting grades to students.

Grade Reports
Final grades are available through the secure, student access pages of the Registrar's web page and through the telephone registration system (consult Schedule of Classes for access instructions). Unsatisfactory grade reports are mailed to students in the middle of each semester for courses in which the student is performing below average.

Final Grade Changes/Appeals
When a grade of other than Incomplete (\( I \)) is reported officially by an instructor at the end of a term, the grade is recorded by the Registrar and can be changed only if an error has been made in assigning or reporting the grade. When a grade is assigned consistent with University policy, only the instructor has the right to change the grade except as provided in the Incomplete grade policy. When an instructor reports a change for a grade other than \( I \), the Change of Grade Form must be signed by his/her Department Chairperson and Dean. When a student believes that a course grade is incorrect, the student's inquiry should be directed to the instructor within 10 days after the formal grade report is received. If the student is unable to resolve the grievance through consultation with the instructor, a written request for review of the course grade may be submitted to the chair of the department or program in which the course was taught. Requests for review must be submitted within the first four weeks of the next regular academic semester. Requests for review submitted after the deadline will be heard only in exceptional cases as determined by the dean of the college in which the appealed course grade occurred. To initiate a grade review, the student should request in writing to the department chair a review of the final course grade.

Grades are appealed through the program offering the course and then, if necessary, through the college in which the grade was assigned.

Grades
Letters are used to designate the quality of student academic achievement.

Grade of I (Incomplete)
The grade of I is assigned at the discretion of the instructor when a student who is otherwise passing has not, due to circumstances beyond his/her control, completed all the work in the course. The missing work must be completed by the deadline specified by the instructor or during the next semester (fall or spring) in residence, but no later than 12 months after the term in which the I was assigned, whichever comes first. If the I is not removed during the specified time, a grade of \( F, U \) or NC as appropriate is automatically assigned. The grade of I cannot be removed by enrolling again in the same course.

Grade of IP (In Progress)
The grade of IP is based on coursework for courses that extend over more than one semester. For example, a course that requires enrollment for two consecutive semesters would be eligible for an IP grade in the first term (i.e., Graduate Thesis, Dissertation, etc.) The grade in the second term is also awarded for the course in the first semester. A grade of IP should not be given for coursework to be completed in one given term. It cannot be substituted for a grade of I. The IP grade expires after six years, and if no final grade has been awarded by that
time, the IP grade will default to a grade of NC (no credit).

Grade of W (Withdrawal or Drop)
No grade will be given for a course dropped on or before the last day to drop a course without record. After this period a student who is permitted to drop or withdraw from a course will receive a grade of W. Only students with such extenuating circumstances as serious illness will be permitted to drop a course after the sixth week of classes in the semester or to withdraw from all courses during the last two weeks of classes in the semester. Unsatisfactory academic performance itself is not an extenuating circumstance. The date of withdrawal is determined when the withdrawal form is accepted by the Registrar's Office.

Pass/No Credit or Pass/Unsatisfactory Option
Certain graduate courses, such as research seminars, tutorials, internships, theses or dissertations, may be designated for Pass/No Credit or Pass/Unsatisfactory grading upon recommendation of the offering department and approval of the Graduate Council. The grade of P in such a course shall be considered as evidence of satisfactory performance. A grade of NC (No Credit) or U (Unsatisfactory) in such a course shall be considered as evidence of unsatisfactory performance and will result in automatic suspension from the University.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Meaning</th>
<th>Grade Points per Semester Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Commendable</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Satisfactory</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Marginal</td>
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</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
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<tr>
<td>IP</td>
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<tr>
<td>W</td>
<td>Withdrawal</td>
<td></td>
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<tr>
<td>P</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>NC</td>
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</tr>
<tr>
<td>AU</td>
<td>Audit</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td>No recognition given</td>
<td></td>
</tr>
</tbody>
</table>

Grade Point Average
For graduation purposes, the grade point average for a graduate student is based on those courses in his/her approved program of study taken at UNC Charlotte. It is determined by multiplying the number of grade points for each grade (A=4, B=3, C=2, U=0) by the number of semester hours credit received in that course, adding all accumulated grade points together, and then dividing by the total number of semester hours the student has attempted except those for which the student received a grade of I, IP, W, P, NC, AU, or NR. When a course not listed as "May be repeated for credit" is repeated, no additional credit hours attempted accrue and the hours earned and grade points of the previous grade are replaced by those of the current grade.

Graduate students must have a 3.0 GPA in the courses listed on the Application for Admission to Candidacy Form in order to graduate. However, the grades for all courses attempted will remain on the transcript and will be included in the calculation of the student’s GPA as it is reported on the transcript.

Repeating a Graduate Course
A graduate student will be allowed to repeat a maximum of two courses in which the student has been assigned a grade of C, U or NC (but not an f). If the course grade resulted in suspension of enrollment, the student must appeal to be reinstated in order to repeat the course. A given course may be repeated one time only. Whenever a course is repeated, no additional hours attempted accrue, and the new grade replaces the previous grade in computing the grade point average and in the assignment of academic credit. The record of the first attempt will remain a part of the student's permanent record and will count in the number of marginal (C) grades accumulated. Successfully repeating a course does not change the number of marginal (C) grades accumulated. Enrollment will be terminated if a student receives a grade of U in a repeated course.

Academic Records and Transcripts
The Graduate School is responsible for maintaining the official academic records for all students. Upon written request by the student, an official transcript of the academic record will be issued, by the Registrar's Office to the person or institution designated, provided that all the student's obligations to the University have been settled satisfactorily.

Requirements for Continued Enrollment
Students enrolled in any graduate program must maintain satisfactory progress toward the degree. Students are expected to achieve a commendable or satisfactory grade (A or B) in all course work attempted for graduate credit.

An accumulation of three marginal (C) grades will result in suspension of the student's enrollment in the graduate program. If a student makes a grade of U or NC on any course, enrollment will be suspended. A graduate student whose enrollment has been suspended because of grades is ineligible to register in any semester or the summer session unless properly reinstated.

A student reinstated in a graduate program will be expected to complete the degree program with satisfactory or commendable performance. Should the student receive a grade of C, U, or NC after being reinstated in the program, his/her enrollment in the graduate program will be terminated.
Requirements for Readmission

Students in good standing

Students seeking readmission for a term that is two years or more after the term he/she last attended also must apply for admission to the Graduate School.

Students whose enrollment is suspended for academic reasons

Students must appeal their suspension and be reinstated in order to continue their program of study. After notification of suspension is received, the student initiates the appeal procedure by submitting a Suspension Appeal Form (sent to the student with the notice of suspension) to the graduate coordinator of his/her academic program explaining any extenuating circumstances. The graduate coordinator will forward this form to the Graduate School with a recommendation regarding reinstatement. The Dean of the Graduate School will notify the student of the decision in writing.

Transferred Credit

The student’s graduate program coordinator is responsible for determining the applicability of transferred credits to graduate program requirements. See the appropriate “Degree Requirements” sections of this Catalog for the number of hours that may be transferred and "Time Limit" sections for completion of courses. General rules governing transferred credit are:

1) To obtain approval to receive transfer credit, the student must submit an Application for Transfer of Credit into a Graduate Degree Program form (available in the Graduate School office), approved by the graduate program coordinator, to the Dean of the Graduate School. If the courses being transferred are from another institution, the student must include a copy of the transcript along with the request. The University is not obligated to accept any courses for transfer credit.

2) The grade in any course accepted for transferred credit must be the equivalent of that awarded for commendable (A) or satisfactory (B) work as defined by UNC Charlotte. It should be noted, however, that although the credit for a course may transfer, the grade will not be used to calculate the graduate GPA at UNC Charlotte.

3) Courses accepted for transfer are subject to the same time limitation as courses taken in residence.

4) To be considered for transferred credit, the courses must have been undertaken at a regionally accredited institution.

5) Courses in which credit is accepted must be appropriate for approved University programs and curricula in which the student is enrolled.

6) To obtain approval to take a course at another institution while at UNC Charlotte, a student must complete an Application for Transfer of Credit into a Graduate Degree Program form and have it approved by the graduate program coordinator prior to taking the course. Upon completion of the course(s) the student must submit the Application for Transfer of Credit into a Graduate Degree Program form along with an official transcript listing the course(s) to be transferred to the Graduate School.

7) Transfer credit is not awarded for post-baccalaureate students.

Credit by Examination

A student currently enrolled at UNC Charlotte may pass a specially prepared challenge examination and receive credit for a University course without having to do the normal course work. The student contacts the program in which credit is sought to request administration of an examination. Since it may not be appropriate to award credit by examination for some courses, the decision to offer an examination is that of the program. If the graduate program authorizes an examination, the student is instructed to pay the fee for credit by examination and to bring the receipt of payment to the examination. Credit by examination will be indicated on the transcript, but no grade points will be awarded. Failure on such an examination will incur no grade-point penalty. No student may challenge a course for which either a passing or failing grade has been received at UNC Charlotte.

Application for the Degree

Each student should make application for his/her degree on a form obtained from the Graduate School or the Graduate School’s Web Page no later than the filing date specified in the University Calendar. The application must be accompanied by the filing fee in effect at the time of the application. Degrees are awarded at commencement exercises held at the end of the spring and fall semesters; however, the diploma and transcript will reflect the term in which all requirements were completed.

Earning A Second Degree

A student is permitted to earn a second graduate degree subject to the following conditions:

1) no work applied to a previously awarded degree may be applied to the new degree program,

2) the student must be admitted to a degree program different from that of his/her previous graduate degree(s),

3) the student must successfully meet all requirements for the new degree.

Appeal Procedure

Grievances relating to academic status are to be addressed to the Graduate School.

The Code of the University of North Carolina provides that under certain conditions a grievant may appeal from a chancellor’s disposition of a grievance. The line of appeal is to the president or Board of Trustees. The line of appeal from a decision of the president or the Board of Trustees is to the Board of Governors.

The full text of the Board of Governors regulation concerning time limits on appeals may be found on-line as Item III-J-7 in “The Administrative Manual of the
MASTER'S DEGREE REQUIREMENTS

Residence Requirements
No more than six semester hours of transferred credit are accepted toward a master's degree. All other work must be residence credit.

Residence credit is credit that is earned under the conditions specified herein and may be applied toward the attainment of graduate degrees at UNC Charlotte. These conditions must be satisfied regardless of the location in which the course is given.

1) Instruction: The instructor must be a member of the UNC Charlotte Graduate Faculty.
2) Course(s): The content of each course must be approved by regularly established college, Graduate School and University curricular processes before the course is scheduled or offered.

Residence credit may also be awarded by virtue of an examination administered by the faculty of the department offering credit. (See Credit by Examination on page 25 of this Catalog.)

Advisory Committee
All students in graduate programs must have a graduate advisor who is a member of the Graduate Faculty in the student's major program. The graduate program coordinator/director appoints the graduate advisor. In the case of master's programs requiring theses and/or final oral examinations, the graduate advisor serves as chair or co-chair of the committee.

In all master's programs requiring a committee, the committee will consist of at least three graduate faculty members, one of whom is designated as chair. In programs not requiring a committee only a major advisor is necessary.

Program Approval
Each student's individual program of study must be approved by his/her department/college. Up to six hours of transferred credit may be included in the approved program of study.

Admission to Candidacy
Upon successful completion of a minimum of 18 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which he/she expects to complete all requisites for the degree, a student should complete the Application for Admission to Candidacy Form supplied by the Graduate School. This application is a check sheet approved by the student's adviser, department chairperson and college dean listing all course work to be offered for the degree (including transferred credit and courses in progress).

Minimum Hours and Quality
A student is expected to satisfactorily complete a minimum of 30 to 60 semester hours of approved graduate level courses, depending upon his/her individual program, with an overall GPA of 3.0 or better in courses listed on the Application for Admission to Candidacy Form. Grades in all courses attempted, whether or not on the plan of study, will remain on the transcript and will be included in the calculation of the student’s GPA as it is reported on the transcript. No more than six hours evaluated as C may be counted toward the minimum hours required for the master's degree.

Comprehensive Examination
After admission to candidacy, each student must successfully complete a comprehensive examination. The examination may be written, oral, or both, depending upon the student's specific program requirements. Students must be enrolled during the semester in which they take the comprehensive examination.

Time Limit
University policy requires that no course listed on a master's student's candidacy form be older than six years at the time of graduation. This policy is in place because of the University's interest in a degree being current when it is awarded. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to count in a degree program.

To revalidate a course, the student, along with the program coordinator and the course instructor, prepare a revalidation plan that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate courses with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions. Additionally, no more than 25% of the courses on a student’s program of study may be revalidated and for master’s students no course older than eight years may be revalidated.

Thesis
The plan of study for a master's degree may or may not include completion of a thesis. The thesis and non-thesis approaches are designed to meet the needs of students preparing for different types of careers and represent qualitatively different educational experiences. Consequently, the academic departments and the Dean of the Graduate School discourage any switching from one plan to another. If a switch from a thesis to non-thesis
plan is approved, the grade of I for the thesis work will be changed to W on the transcript with no refund of tuition for the course(s). At the time that the graduate program approves the student’s thesis topic, the Petition for Topic Approval must be filed with the Graduate School. This form is available in the Graduate School.

The thesis must be submitted for final approval by the student's thesis committee at least three weeks before the date of the oral examination in which the thesis is defended. Following the successful completion of this defense, the master's candidate must submit three unbound copies of the approved and error-free thesis to the Graduate School no later than the filing date indicated in the University Calendar.

**Course and Other Requirements**

The course and other requirements for specific degree programs are presented in the sections of this Catalog describing each individual program.

**PH.D. DEGREE REQUIREMENTS**

A doctoral degree is conferred by the University after the student has demonstrated outstanding scholarship in an approved program of study. Candidates must satisfy all University degree requirements in addition to all standards established by the doctoral faculty of their particular program. Specific program degree requirements are listed under the respective doctoral programs in this Catalog. In some cases, requirements in a given program are more stringent than the minimum requirements established by the Graduate School.

Ordinarily, a student must complete at least 72 post-baccalaureate credit hours in order to earn the Ph.D.

**Advisory Committees**

All students in graduate programs must have a graduate advisor who is a member of the Graduate Faculty in the student's major program. The graduate program coordinator/director appoints the graduate advisor.

For doctoral students the committee will consist of at least four Graduate Faculty members, one of whom is appointed by the Dean of the Graduate School as the Graduate Faculty representative.

The committee for doctoral students is indicated on the Petition for Topic Approval (available in the Graduate School office). At the time that the Petition for Topic Approval is approved, the Graduate School appoints the Graduate School Representative to serve on the doctoral committee.

**Program of Study**

Although the maximum amount of credit past the baccalaureate degree that a Ph.D. student may count towards a doctorate is 30 semester hours, only courses appropriate for the approved program and curriculum in which the student is enrolled may be transferred. This should be determined by the student's supervisory committee and approved by the program coordinator, before the request is submitted to the Graduate School. This rule applies whether the courses were taken at UNC Charlotte or elsewhere and whether a master's degree was earned or not. However, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

**Program Approval**

By the end of the first semester of the third post-baccalaureate year in the program, and no later than the filing of the petition to sit for the qualifying examination, a student's program of study must be approved by his or her advisory committee and submitted to the Dean of the Graduate School.

**Course and Other Program Requirements**

The course and other requirements for each degree program are indicated in the program descriptions in the following pages.

**Time Limit**

University policy requires that no course listed on a doctoral student's candidacy form be older than eight years at the time of graduation. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to count in a degree program. Transferred credits past the baccalaureate degree that count towards a doctorate are not subject to the standard time limit to complete the degree (see the Transferred Credit policy elsewhere in this catalog).

To revalidate a course, the student, along with the program coordinator and the course instructor, prepare a revalidation plan that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate courses with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions. Additionally, no more than 25% of the courses on a student's program of study may be revalidated and no course older than ten years may be revalidated.
Residence
All doctoral students are required to complete a substantial residency requirement during which they have sustained contact with the graduate faculty. This requirement is specified in the program descriptions.

Graduate Faculty Representative
The graduate faculty representative is a member of the doctoral student's advisory committee appointed by the Graduate School. This faculty member's role is primarily procedural. He/she must 1) assure that the doctoral student is treated fairly and impartially by his or her advisory committee, and 2) assure that University standards and policies are upheld. This representative is appointed prior to the student's taking the qualifying examination and must participate in the examination, in the dissertation topic approval process, and in the final examination. A student's advisor may consult with the Dean of the Graduate School regarding selection of this representative.

Qualifying Examination
Each student must complete a qualifying examination. Ordinarily students who enter a Ph.D. program directly from a baccalaureate program sit for this examination before the end of their third post-baccalaureate year in the program while students who enter a Ph.D. program from a master's degree program take the examination before the end of their first year in the doctoral program. To sit for this examination, the student must have at least a 3.0 GPA and must have removed any conditions upon admission.

Re-examination
A student who fails the qualifying examination may petition the program faculty to be re-examined. The re-examination may take place no sooner than the beginning of the semester following the one in which the failure occurred. A student who fails the qualifying examination a second time may not continue in the doctoral program.

Candidacy
The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School. Candidacy must be achieved at least six months before the degree is conferred.

Dissertation
The doctoral program of study must include 18 hours of research credit including dissertation credit. The doctoral candidate must be continuously enrolled in dissertation credit hours beginning with the semester after the dissertation topic is approved until the semester of graduation.

The dissertation must be submitted for final approval by the student's committee at least three weeks before the date of the final examination in which the dissertation is defended. Following the successful completion of this defense, the doctoral candidate must submit four unbound copies of the approved error-free manuscript to the Graduate School no later than the filing date indicated in the University calendar.

The Graduate School requires publication of the dissertation on microfilm and in Dissertation Abstracts International by University Microfilms International of Ann Arbor, Michigan. The student is responsible for paying the microfilming and optional copyrighting fees. Any other arrangements for publications of the dissertation must not interfere with publication by University Microfilms International.

Final Examination
Each candidate must pass a final examination over the contents of the dissertation. Sometimes called the "dissertation defense" or the "dissertation oral," this meeting is traditionally open to members of the University community. No student is permitted to take the final examination more than twice.

ED.D. DEGREE REQUIREMENTS
The Doctor of Education (Ed.D.) degree is conferred by the University after the student has successfully completed all requirements in an approved doctoral program of study in the College of Education. Specific program degree requirements are described in the College of Education section of this Catalog.

Program of Study
Although the maximum amount of credit past the Master's of School Administration (M.S.A.) degree that an Ed.D. student may count towards a doctorate is 9 semester hours, only educational administration courses approved by the program coordinator may be transferred. This rule applies whether the courses were taken at UNC Charlotte or elsewhere; however, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

Time Limit
All courses including accepted transferred credit, that are listed on the candidacy form cannot be older than eight years at the time of graduation. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to count in a degree program.
To revalidate a course, the student, along with the program coordinator and the course instructor, prepare a revalidation plan that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate courses with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions. Additionally, no more than 25% of the courses on a student’s program of study may be revalidated and no course older than ten years may be revalidated.

GRADUATE CERTIFICATE REQUIREMENTS

The graduate certificate is awarded for successful completion of a coherent program of at least 12 credit hours proposed by a unit of the graduate faculty and approved by the Graduate Council. Students are admitted to a specific graduate certificate program and are advised by faculty in the unit offering the graduate certificate.

Since the graduate certificate is not a degree, students may apply the credits earned in the certificate program toward a degree that they pursue either in conjunction with the graduate certificate or after the certificate has been awarded.

Students may enroll in a graduate certificate program only or may complete the certificate in conjunction with a graduate degree program at the University. Hours taken toward a graduate certificate may be counted toward a graduate degree program with the consent of the graduate program coordinator.

Graduate certificate programs generally require at least 12 hours. Up to six hours taken at post-baccalaureate status at UNC Charlotte may be applied toward a certificate with the approval of the program coordinator. Although a student ordinarily may not transfer hours from another institution into a certificate program, some programs may allow up to six hours of transferred credit. The graduate certificate is awarded to a student who has completed the specified program of study with a GPA of 3.0 or better within four years from the time of enrollment in the first certificate course.

FAMILY EDUCATIONAL RIGHTS and PRIVACY ACT (FERPA) NOTIFICATION

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They are:

1) The right to inspect and review the student’s education records within 45 days of the day the University receives a request for access.

Students should submit to the Registrar, dean, head of the academic department, or other appropriate official, written requests that identify the record(s) they wish to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2) The right to request amendment of the student’s education records that the student believes are inaccurate or misleading.

Students may ask the University to amend a record that they believe is inaccurate or misleading. They should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading.

If the University decides not to amend the record as requested by the student, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student’s when notified of the right to a hearing.

3) The right to consent to disclosures of personally identifiable information contained in the student’s education records, except to the extent that FERPA authorizes disclosure without consent.

One exception that permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person serving or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a
disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

A school official has legitimate educational interest if the official needs to review an education record in order to fulfill his her professional responsibility.

4) The right to file a complaint with the U.S. Department of Education concerning alleged failures by UNC Charlotte to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is: Family Policy Compliance Office, U.S. Department of Education, 600 Independence Avenue, SW, Washington, DC 20202.

UNC Charlotte intends to comply fully with these requirements. Policy Statement No. 69, "The Privacy of Educational Records," explains the procedures for compliance. Students may obtain copies of the Policy in the Office of the Registrar or http://www.uncc.edu/unccatty/policy/state/, and copies of the policy statement are available for inspection in the offices of each dean and department chair. The policy includes a list of the locations of all education records maintained by the institution.

The following categories of personally identifiable information about a student's educational record have been designated as public or "directory" information which may be disclosed for any purpose without student consent: a student's name, local and permanent address, email address, telephone number, date and place of birth, class, major field of study, dates of attendance, enrollment status, degrees and awards (including scholarships) received, participation in officially recognized activities and sports, weight and height of members of athletic teams, and the most recent previous educational agency or institution attended.

Currently enrolled students may withhold disclosure of information in any category by completing the appropriate form available in the Office of the Registrar. Written requests for non-disclosure will be honored for a maximum of one year, and all such requests will expire on the following August 31. UNC Charlotte assumes that failure to complete the request indicates approval for disclosure.

All questions concerning this policy on educational records may be directed to the attention of the Registrar.
The College of Architecture at the University of North Carolina at Charlotte offers a fully accredited program recognized for the outstanding quality of its faculty and students, commitment to outreach and community involvement, and facilities. Students focus on concentrations in Urbanism, Technology, or Design, Theory & Practice. Each area of study is well-supported not only by coursework but also by travel and research opportunities. For example, the College participates in several European and Latin American semester exchange programs, and summer opportunities that further inform students’ work and broaden their global understanding include programs in Spain, Italy, Canada, and Australia. The Charlotte Community Design Studio (CCDS) offers hands-on experience with urban design efforts affecting Charlotte and the region, the work of the Catalyst Project and the offering of a design-build studio each year affects the lives of economically disadvantaged citizens of our community on a more intimate scale. Because the College stresses the importance of ‘making’ in addition to thinking, the wood, metal, computer, and laser workshops are all equipped with the latest high performance equipment to enable students to both explore and embody their design ideas. Contact with the profession is also emphasized and the College is frequently enriched by the expertise of local practitioners. An extensive lecture series involving nationally and internationally recognized designers and theorists further enhances the educational environment and exposure to current artifacts and schools of thought.

**Graduate Degree Programs**

- Master of Architecture I
- Master of Architecture II

**ARCHITECTURE**

**College of Architecture**
Storrs Architecture Building
704-687-2359

**Degree**

M.Arch.

**Program Coordinator**

Betsy West

**Program Description**

The Master of Architecture degree (M.Arch.) serves two groups of students: 1) the three-year M.Arch. I Program which includes two summer sessions accommodates students whose previous degree is outside the field of architecture; and 2) the two-year M.Arch. II Program serves students who have already completed a four-year degree program in architecture at a National Architectural Accrediting Board (NAAB) accredited institution. The courses and options within each program are similar, but the advanced standing of M.Arch. II students allows them to complete the degree requirements in two years. Students in both programs must complete a comprehensive design or thesis project under the advisement of a faculty committee. Full time academic status is expected in both programs.

**The M.Arch. I Program** involves four primary components: 1) the first year focuses on establishing a strong foundation in fundamental design skills, architectural history and theory, building to site relationships, and introductory building technologies; 2) the second year focuses on architectural design and its relationship to building systems as well as more advanced studies in history, theory, and building technology; 3) the summer study program provides the opportunity to engage international education, research, or design experience; and 4) the third year is dedicated to the student's comprehensive design project or thesis project research and execution.

**The M.Arch. II Program** is tailored through the advising process to the previous educational background of the students and to their individual professional and research goals. The program involves two primary components: 1) the first year focuses on architectural building design and topical studios with advanced studies in their area of concentration; and 2) the second year is dedicated to continued study within their concentration as well as the comprehensive design project or thesis project research and execution.

At the end of the first year of study, M.Arch. I students are required to choose an area of concentration which will guide their advanced studies. M.Arch. II students are required to choose an area of concentration upon entering the program. Concentrations include 1) Architectural Design, Practice, and Theory, 2) Urban Design, and 3) Architectural Technology. Concentration coursework is comprised of three elective courses (selected by the student from a larger set of eligible courses) and one elective studio with a focus similar to that of the concentration (offered as a topical studio). The concentrations from which students can choose are described below:

**Architectural Design, Theory, and Practice**

This concentration focuses on a sophisticated and detailed study of building and site design involving issues of form, space, order, and typology as well as cultural and physical context, concept and meaning, etc. It includes
both investigation and criticism of contemporary practice and practitioners as well as the role of theory and historical precedent relative to the design and making of architecture.

**Urban Design**
This concentration focuses on the critical role of architecture in the city - the process and specific intent of physical intervention in urban landscapes and infrastructures. Through the design of groups of buildings as well as larger scale urban areas, issues of policy, politics, finance, planning, place, and culture are introduced as part of the essential conception and history of the city fabric.

**Architectural Technology**
This concentration focuses on study and experimentation addressing emerging issues of sustainable design and the creative development of building envelopes and systems that utilize both new and traditional materials, technology, and construction methods in innovative and beautiful ways. Seeking to explore the historical as well as contemporary realms of thermal, tactile and visual issues embedded in this field, students address appropriate material selection, methods of daylighting, passive and active systems for heating and cooling, etc. with consideration of both qualitative and quantitative outcomes.

**Degree Requirements**

**Master of Architecture I Curriculum**
The M.Arch. I program requires a minimum of 92 hours to be completed during three academic years and two summer sessions.

**Summer (3 hours)**
ARCH 5050 Introductory Design Experience (3)

**Year 1 - Fall (13 hours)**
ARCH 6111 Design Studio (7)
ARCH 5211 Architectural History Survey 1 (3)
ARCH 5601 Ideas in Architecture (3)

**Year 1 - Spring (15 hours)**
ARCH 6112 Design Studio (6)
ARCH 5212 Architectural History Survey 2 (3)
ARCH 5312 Architectural Materials (3)
ARCH 6151 Design Methodology (3)

**Year 2 - Fall (14 hours)**
ARCH 7101 Design Studio (5)
ARCH 5213 or ARCH 6050 -History/Theory Topics or Concentration Elective (3)
ARCH 5314 Structures Two (3)
ARCH 6050 Concentration Elective (3)

**Summer (6 hours)**
ARCH 7110 Summer Study Program (6)

**Year 3 - Fall (14 hours)**
ARCH 7103 Design Studio (5)
ARCH 5317 Building Systems Integration (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)
ARCH 7111 Research/Thesis Document Prep (3)

**Year 3 - Spring (14 hours)**
ARCH 7104 Project/Thesis Studio (8)
ARCH 5112 Professional Practice (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)

Total Credit Hours - 92

**Master of Architecture II Curriculum**
The M.Arch. II program requires a minimum of 56 credit hours to be completed during two academic years. If accepted applicants are evaluated and found deficient in entry-level competencies, they will be required to enroll in additional course work beyond the 56 credits to complete their degree. Below is a list of expected entry-level competencies.

**Expected Entry-Level Competencies for M.Arch. II Candidates:**
1) A minimum of six semesters of architectural design studios;
2) A minimum of four semesters of architectural history and/or theory courses;
3) A minimum of four semesters of building technology courses equivalent to the following UNCC College of Architecture courses:
   - ARCH 4312 Architectural Materials
   - ARCH 4313 Structures One
   - ARCH 4314 Structures Two
   - ARCH 4315 Environmental Control Systems.

To ensure that incoming students are evaluated appropriately, the College of Architecture requires candidates for the M.Arch. II program to furnish the Architecture Graduate Admissions Committee and Graduate Program Coordinator relevant course descriptions and syllabi of all architecture courses passed and completed which may satisfy entry-level competencies. The following curriculum is modeled for students accepted to the program who have satisfied all entry-level competencies.

**Year 1 - Fall (14 hours)**
ARCH 7101 Design Studio (5)
ARCH 5213 History/Theory Topics (3)
ARCH 5317  Building Systems Integration (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)

Year 1 - Spring (14 hours)
ARCH 7102 Design Studio (5)
ARCH 6050 Concentration Elective (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)
ARCH 6151 Design Methodologies (3)

Summer (3-5 hours - Optional)
ARCH 7120 Graduate Summer International Study (Optional) (5)
ARCH 7950 Graduate Summer Research Study (Optional) (3)

Year 2 - Fall (14 hours)
ARCH 7103 Design Studio (5)
ARCH 6050 or X - Concentration Elective or General Elective (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)
ARCH 7111 Research/Thesis Document Prep (3)

Year 2 - Spring (14 hours)
ARCH 7104 Project/Thesis Studio (8)
ARCH 5112 Professional Practice (3)
ARCH 6050 or X - Concentration Elective or General Elective (3)

Total Credit Hours - 56

Graduate Advising
A critical component of any successful graduate program is academic advising and guidance during the course of a student's program of study. The primary advisor for all graduate students in the College of Architecture will be the Graduate Program Coordinator. Students entering their final year will be asked to complete a final plan of study and identify possible committee members from the faculty to serve as advisors for their final project or thesis.

Transfer Credit
Transfer credit is normally limited to a maximum of six hours because of the nature of the program. Under special circumstances, however, a greater number of hours may be transferred if a student can demonstrate that the replacement courses meet or exceed the level of graduate curricula offered by the College. The amount of transfer credit is subject to Graduate School approval.

Assistantships, Tuition Differentials, and Scholarships
A limited number of teaching assistantships and tuition waivers are available to both M.Arch. I and II candidates. Awards are strictly based on the applicant's academic merit and promise.

National Architectural Accrediting Board
In the United States, those who want to practice architecture must be registered and licensed in each state in which they seek to practice architecture. Many states, including North Carolina, have adopted the requirement that any architect must first obtain a professional degree in architecture accredited by the National Architectural Accrediting Board (NAAB). Following the completion of a professional degree program accredited by the NAAB, the future architect must serve an internship working for a registered architect. (Note: A portion of this time may be completed as a student when enrolled at a NAAB accredited school of architecture.) The NAAB defines an accredited degree as described below:

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Masters degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

All graduate programs of the UNC Charlotte College of Architecture are fully accredited by NAAB as professional degree programs.

COURSES IN ARCHITECTURE

Required Studio Courses
ARCH 5050. Introductory Design Experience. (3)
Prerequisite: B.A., B.S. or equivalent college degree. This introductory graduate course in architecture is intended for students newly admitted to the College of Architecture's M.Arch. I professional program. This three week, intensive studio-based course includes an introduction to freehand drawing, 2-D composition, 3-D modeling, and visual theory. In addition, the course offers an introduction to a variety of related topics (history, structure, lighting, materials, etc.) that serve as critical departure points for understanding and making architectural projects. (Summer)

ARCH 6111. Design Fundamentals/Skills. (7)
Corequisite: ARCH 5601. This introductory architectural design studio focuses on fundamental concepts of architecture as well as the acquisition and practice of a wide range of technical and graphic skills and media. It is
intended to complement the reading and writing engaged in ARCH 5601 (Ideas in Architecture) and to serve as an arena to explore and test the issues encountered in that course through the act of making. (Fall)

ARCH 6112. Design Fundamentals/Skills. (6)
Prerequisite: ARCH 6111. This introductory architectural design studio focuses on the development of site, space, and design process issues as well as the continued acquisition and practice of a variety of technical and graphic skills. Exploration into the creative and appropriate use of a variety of media is addressed. (Spring)

ARCH 7101. Building Design Emphasis Studio. (5)
Prerequisite ARCH 6112. This design studio focuses on site specific projects emphasizing technological and systemic issues that lead toward comprehensive building designs. (Fall)

ARCH 7102. Topical Studio. (5) Prerequisite: ARCH 7101. This design studio focuses on issues relevant to current architectural practice and/or exploration of architectural theory. Students choose from among several sections of this studio, each of which is addressing a different set of issues. The issues addressed as well as the pedagogical approach of these studios are defined by the faculty teaching them. (Spring)

ARCH 7103. Topical Studio. (5) Prerequisite: ARCH 7102. This design studio focuses on issues relevant to current architectural practice and/or exploration of architectural theory. Students choose from among several sections of this studio, each of which is addressing a different set of issues. The issues addressed as well as the pedagogical approach of these studios are defined by the faculty teaching them. (Fall)

ARCH 7104. Comprehensive Design Project/Thesis Project Studio. (8) Prerequisite: ARCH 7103. This studio offers support and structure for students undertaking their individualized comprehensive design project or thesis research project. The faculty member teaching 7104 coordinates the activities of the students and their advisory committees. (Spring)

**Required Core Courses**

ARCH 5112. Professional Practice. (3) This course serves as an introduction to the objectives of the practice of architecture, its responsibilities and procedures, and emerging alternative forms of practice as they pertain to the role of the architect. (Spring)

ARCH 5211. Architectural History I. (3) This course is a survey of the theoretical, technical, and cultural background of architecture and urban design from prehistory to 1750. (Fall)

ARCH 5212. Architectural History II. (3) Prerequisite: ARCH 5211. This course is a survey of the theoretical, technical, and cultural background of architecture and urban design from 1750 to present. (Spring)

ARCH 5213. History/Theory Elective. (3)
Prerequisite: ARCH 5212 or equivalent, or permission of instructor. This elective offers a study of topical areas of history and theory in architecture. To fulfill the requirements of ARCH 5213, students choose from among several history/theory courses, each of which addresses a different topic. These courses complement the survey courses (ARCH 5211 and 5212), and serve to inform and develop in-depth research, writing, and presentation skills. (See current College of Architecture Prospectus for a listing of courses.) (Fall)

ARCH 5214. History/Theory Elective. (3)
Prerequisite: ARCH 5213 or equivalent, or permission of instructor. This elective offers a study of topical areas of history and theory in architecture. To fulfill the requirements of ARCH 5214, students choose from among several history/theory courses, each of which addresses a different topic. These courses complement the survey courses (ARCH 5211 and 5212), and serve to inform and develop in-depth research, writing, and presentation skills. (See current College of Architecture Prospectus for a listing of courses.) (Spring)

ARCH 5312 Architectural Materials. (3) This course introduces the quantitative and qualitative characteristics of architectural materials, systems, and processes. Students will be introduced to the physical properties of materials relevant to their application in construction, assembly, and detail systems. Topics will include masonry, concrete, wood, steel, glass, cladding, and roofing and flooring materials and their assemblies. (Spring)

ARCH 5313. Structures One. (3) Prerequisite ARCH 5312. This course introduces issues relevant to the fundamentals of structures including statics, strength, and stability of materials. Students will be introduced to structural concepts, systems, and the tracing of structural loads through basic principles, physical modeling, and theoretical and analytical methods. Topics will include interrelationship between strain, stress, and stability, as well as the implications of tension, compression, shear, torsion, and bending. (Fall)

ARCH 5314. Structures Two. (3) Prerequisite: ARCH 5313. This course introduces specific structural applications of wood, steel, concrete, and masonry systems commonly used in small-scale commercial/institutional buildings. Students will be introduced to the design of beams, columns, walls, joinery, and connections appropriate to each material type through theoretical, analytical, and computer simulation methods. (Spring)

ARCH 5315. Environmental Control Systems. (3) Prerequisite ARCH 5312 and co-requisite ARCH 5313. This course introduces qualitative and quantitative
analytical methods commonly used to assess the impact of environmental forces on occupant thermal and luminous comfort, energy performance, and regional sustainability. Students will be introduced to the interplay between climatic events, patterns of building use, and the architectural variables that inform the appropriate application of building systems technology. Topics will include building envelope performance, and the introduction of passive and mechanical systems for heating, cooling, illuminating, and ventilating buildings. 

**ARCH 5317. Building Systems Integration. (3)**
Prerequisites: ARCH 5314 and ARCH 5315. This course will introduce a set of advanced issues related to the comprehensive, systemic integration of building technology systems commonly used in large-scale buildings through case study, analytical, and simulation methods. Topics will address the resolution of building structure, materials, environmental systems, mechanical systems, electrical systems, life safety, building water supply and waste, and conveying systems in building design. 

**ARCH 5601. Ideas in Architecture. (3)** Prerequisite: ARCH 5050. Corequisite: ARCH 6111. This seminar class concentrates on fundamental concepts, issues, and working knowledge specific to design in architecture. It is intended to complement the design problems encountered in ARCH 6111 (studio) and to serve as a critical platform to raise issues that are not always evident in studio making alone. Primary topics addressed include order, form and space, site, type, and architectural meaning.

**ARCH 6151. Design Methodology. (3)** This course focuses on examination of analytic and synthetic models including information processing, programming, and implementation activities used to structure the architect's design process, conjectural models, and methods specific to the architect's creative skills.

**ARCH 7110. Summer Study Program. (6)** Prerequisite: completion of the first two years of the COA M.Arch. I Program (or equal). There are three study options for ARCH 7110 that M.Arch. I students may engage in the summer prior to their final year: Research, Independent Design, and International Study. The premise of this course is to allow graduate students to tailor a summer experience to support their growing knowledge of architecture and architectural discourse. This experience is intended to inform and motivate possible interests that the students might pursue in their final year of study.

**ARCH 7111. Research Document. (3)** This course provides structure for the formation and exploration of the ideas and issues relevant to the comprehensive or thesis project undertaken individually by students in their final year of study. This course results in the documentation of case studies, programmatic criteria, procedures, methods, and research in preparation for the execution of the project which is carried out in ARCH 7104. 

**Architectural Elective Courses**

**ARCH 6050. Architectural Elective. (3)** This elective offers study of a wide range of topical areas in architecture. Students can choose from among many courses, each of which addresses a different topic. These courses complement the core courses and studios and allow students to pursue their specific interests. (See current College of Architecture Prospectus for a listing of courses.)

**ARCH 6135. Architectural Theory. (3)** This course addresses the history of ideas and intellectual thought that has influenced architectural discourse, with a particular focus on the 20th C. Readings and seminar discussion serve as the vehicle to debate theoretical tensions in architecture, social import, aesthetics, and tectonics.

**ARCH 7120. Graduate Summer International Study. (5)** Prerequisite: completion of first year of the COA M.Arch. II Program (or equal). ARCH 7120 is an optional International Study course that M.Arch. II students may engage in the summer prior to their final year. The premise of this course is to allow graduate students to engage a summer experience abroad to support their growing knowledge of architecture and architectural discourse. This experience is intended to inform and motivate possible interests that the students might pursue in their final year of study.

**ARCH 7950. Graduate Summer Research Study. (3)** Prerequisite: completion of first year of the COA M.Arch. II Program (or equal). ARCH 7950 is an optional opportunity for research that M.Arch. II students may engage in the summer prior to their final year. The premise of this course is to allow graduate students to engage research activities to support their growing knowledge of architecture and architectural discourse. This experience is intended to inform and motivate possible interests that the students might pursue in their final year of study.

**ARCH 6890. Directed Independent Study. (3)** Prerequisite: permission of the Graduate Coordinator and the graduate faculty member advising the study. This course enables directed individual study and in-depth analysis of a special area related to the interests of the student and the expertise of the advising faculty member.
The College of Arts and Sciences is the largest of the seven colleges at The University of North Carolina at Charlotte, housing 21 academic departments and 7 interdisciplinary programs. The College serves the Charlotte region and the state of North Carolina and is engaged in the discovery, dissemination, synthesis and application of knowledge. It provides for the educational, economic, social, and cultural advancement of the people of North Carolina through on-and off-campus programs, continuing personal and professional education opportunities, research and collaborative relationships with the private, public, and nonprofit institutional resources of the greater Charlotte metropolitan region. The College offers a wide array of graduate programming including graduate certificate, Master of Arts, Master of Science, and Ph.D. programs.

Graduate Degree Programs
Master of Arts in Biology
Master of Arts in Communication Studies
Master of Arts in English
Master of Arts in English Education
Master of Arts in Geography
Master of Arts in Gerontology
Master of Arts in History
Master of Arts in Liberal Studies
Master of Arts in Mathematics Education
Master of Arts in Psychology: Clinical/Community
Master of Arts in Psychology: Industrial/Organizational
Master of Arts in Sociology
Master of Arts in Spanish
Master of Public Administration
Master of Science in Applied Physics
Master of Science in Biology
Master of Science in Chemistry
Master of Science in Criminal Justice
Master of Science in Earth Sciences
Master of Science in Mathematics
Master of Science in Mathematics: Applied Mathematics
Master of Science in Mathematics: Applied Statistics
Ph.D. in Applied Mathematics
Ph.D. in Biology
Ph.D. in History (with Aberdeen)
Ph.D. in Public Policy

Graduate Non-Degree Programs
Certificate in Applied Linguistics
Certificate in Communication Studies
Certificate in Gerontology
Certificate in Technical/Professional Writing

BIOLOGY

Degrees
M.S., M.A., Ph.D.

Coordinators
Dr. Stanley S. Schneider – Master's coordinator
Dr. Yvette M. Huet-Hudson – Doctoral coordinator

BIOLOGY

Master of Science Degree

The Master of Science degree program is designed for students who desire to pursue advanced studies in professional and graduate schools or various vocational opportunities in biology and related areas. The program provides the opportunity for broad training in a variety of biological areas as well as specialization in areas of particular interest to the student. The department is organized into three interest groups reflecting the strengths and research activities of the faculty: Microbiology/ Biotechnology, Cellular/Biomedical, and Ecology/ Environmental. Students may choose one of these as their area of specialization. Also, an arrangement with Carolinas Medical Center in Charlotte allows students to conduct their graduate research at this facility under the direction of one of the hospital staff.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following requirements are specific to the Department of Biology:
Under most circumstances, students admitted to the program will have:
1) A B.S. or B.A. degree from an accredited university.
2) Evidence of undergraduate preparation in biology with a minimum 24 semester hours in biology and 24 semester hours of cognate study.
3) An overall grade point average of at least 3.0 out of 4.0. Additionally, applicants must have a grade point average of at least 3.0 in biology.
4) A score on the Graduate Record Examination General Test in at least the 50th percentile (average for the verbal, quantitative, and analytical sections).
5) A score of at least 550 in the Test of English as a Foreign Language (TOEFL) for applicants whose native language is not English. Students who do not pass this examination must pass ENGL 1100 (English as a Foreign Language) with a grade of C or higher. In addition, these students who will be involved in any instructional activity (e.g., teaching assistants) will be required to be evaluated by the English Language Training Institute at UNC
Charlotte prior to the beginning of the first semester of study.
6) Three letters of reference, at least two of which must be from faculty members.

Degree Requirements
The program leading to the Master of Science degree in Biology requires the successful completion of 30 semester hours of course work approved by a supervisory committee. At least 16 of these hours, including no more than eight hours of thesis research, must be in courses open to graduate students only. In addition to course work, each degree candidate must pass an oral candidacy examination. The candidate must also prepare, present and defend a thesis based upon original research acceptable to the Supervisory Committee and the Dean of the Graduate School.

Admission to Candidacy
General academic regulations will apply to application for admission to candidacy. In addition to these the applicant should have:
1) Removed any identified entrance deficiencies by the time of application.
2) Successfully completed the candidacy examination.
3) Taken at least 15 hours of graduate work with a GPA of 3.0 or better.
4) Satisfied the supervisory committee that he/she is qualified to become a candidate, i.e., can fulfill the requirements successfully.

Assistantships
Teaching and research assistantships are available on a competitive basis for qualified students. A limited number of out-of-state and in-state tuition grants are also competitively awarded.

BIOLOGY
Master of Arts Degree
The Master of Arts degree program is designed for students who choose to write a thesis based upon published scientific literature rather than on laboratory or field research.

Degree Requirements
Students who choose to pursue the Master of Arts degree must complete the requirements for the Master of Science degree with the following exceptions: at least 32 hours of course work. A maximum of four hours of credit for thesis research may be included in the required 32 hours, and three courses of the 32 hours submitted for the degree must include a formal laboratory.

BIOLOGY
Interdisciplinary Doctoral Program
(Biomedical Science and Biotechnology)

The Interdisciplinary Ph.D. in Biology Program has as its intellectual focus a synthesis of the molecular and integrative bases of biomedical sciences and related biotechnology. In addition to a vigorous research concentration, the program emphasizes the importance of relevant course work. All students are required to complete a series of core courses that stress the interdisciplinary nature of the program. These courses expose students to the biological, chemical, physical, and engineering aspects of biotechnology and to the ethical implications of biomedical and biotechnological research. The cornerstone of the program is the student’s research dissertation. Each dissertation is expected to be a significant scientific contribution based on independent and original research, leading to publications in national/international peer-reviewed journals.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Interdisciplinary Ph.D. in Biology.
Under most circumstances, students admitted to the program will have:
1) A B.S. or B.A. degree from an accredited university.
2) An overall grade point average of at least 3.0 out of 4.0. Additionally, applicants must have a grade point average of at least 3.5 in biology, 3.0 in chemistry, and 3.0 in mathematics.
3) A score on the Graduate Record Examination General Test in at least the 65th percentile (average for the verbal, quantitative, and analytical sections).
4) A minimum of 24 hours in biology, which must include at least one course in each of the areas of genetics, physiology, and cell/molecular biology. Additionally, applicants must have one year each of general chemistry, organic chemistry, physics, and mathematics (at least one semester each of calculus and statistics). Applicants with academic deficiencies may be admitted on the condition that any deficiencies are corrected during the first year of graduate study. The Interdisciplinary Ph.D. Committee will determine the remediation necessary for identified deficiencies.
5) A score of at least 550 in the Test of English as a Foreign Language (TOEFL) for applicants whose native language is not English. Students who do not pass this examination must pass ENGL 1100 (English as a Foreign Language) with a grade of C or higher. In addition, these students who will be involved in any instructional activity (e.g., teaching assistants) will be required to be evaluated by the English Language Training Institute at UNC Charlotte prior to the beginning of the first semester of study.
Degree Requirements

The Ph.D. acknowledges the value of course work as background and preparatory for research, but the primary emphasis of the program is on the development of research skills and the completion of a research project on a significant problem in the area of biomedicine or biotechnology.

1. Total hours required.
The program requires 72 post-baccalaureate credit hours. Because of the interdisciplinary nature of this program, all students will be required to take a general curriculum that includes a two-year sequence of core courses as shown below:

Core A: 16 semester hours. Four team-taught semester-long courses in Principles of Biochemistry (Fall, 4 credits), Molecular and Cell Biology (Fall, 4 credits), Microbiology and Immunology (Spring, 4 credits), and Integrative Systems Physiology (Spring, 4 credits). These courses will provide the fundamental background for the applied focus of the program.

Core B: 12 semester hours. Five team-taught semester-long courses in Biophysics (Fall, 3 credits), Bioethics (Fall, 1 credit), Hypothesis Testing (Fall, 2 credits), Biotechnology and Bioengineering (Spring, 3 credits), and Advanced Biochemistry (Spring, 3 credits). These courses will build on the material presented in Core A and will emphasize the chemistry, physics, and engineering principles as they impact biomedicine and biotechnology.

Years 1-4:
Interdisciplinary Colloquium; 4 semester hours (1 hour per year). This course brings together faculty and students from the participating programs in an informal discussion of interdisciplinary research. (Fall semester only).

Years 1-4:
Seminar; 4 semester hours (1 hour per year). Formal student presentations of current literature topics in their area of study. (Spring semester only).

Years 1 & 2:
Laboratory Research Rotations; 6 semester hours total (3 rotations of 2 hours each). These hours may be earned entirely in Year 2, or begun in Year 1 and completed in Year 2.

Years 2 & 3:
Electives; 8 semester hours minimum. Advanced topics courses to be selected by students in consultation with their dissertation committee. These will be specialty topics in the areas of expertise of program faculty.

2. Proportion of courses open only to graduate students.
All the basic core courses, interdisciplinary colloquium, and seminar classes are open to graduate students only. Lab rotations are restricted to doctoral students. At least 4 hours of the minimum 8 hours of electives must be in courses at the 8000 level or higher. The remaining 4 credit hours can be completed in any approved program electives.

3. Grades required.
A student must maintain a cumulative average of 3.0 in all course work taken for graduate credit. Lab rotations and the dissertation research will be graded on a Pass/Unsatisfactory basis and therefore will not be included in the cumulative average. An accumulation of two C grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U in any course, enrollment in the program will be terminated.

4. Amount of transfer credit accepted.
Only courses with grades of A or B may be accepted for transfer credit. Although the maximum amount of credit past the baccalaureate degree that a Ph.D. student may count towards the doctorate is 30 semester hours, only courses appropriate for the program and curriculum in which the student is enrolled may be transferred. This should be determined by the student's Dissertation Committee and approved by the program coordinator, before the request is submitted to the Graduate School. This rule applies whether the courses were taken at UNC Charlotte or elsewhere, and whether a master's degree was earned or not. However, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

5. Photography workshop.
All students will be required to take the photography workshop offered by the Department of Biology.

6. Departmental seminars.
Graduate students are expected to attend all seminars sponsored by the Department of Biology.

7. Advancement to candidacy.
For Advancement to Candidacy, a student must complete the following by the end of the 5th semester of study. First, the student must pass the Candidacy Examination. A dissertation topic will then be proposed to the student's Dissertation Committee. A student advances to candidacy following approval of the proposed dissertation topic by the student's Dissertation Committee and the Dean of the Graduate School.

The doctoral program of study must include a minimum of 18 hours of dissertation credit. The student must complete and defend a dissertation based on a research program approved by the student's dissertation committee which results in a high quality, original and substantial piece of research. The student must orally present and successfully defend the dissertation to the student's dissertation committee in a defense that is open
to the public. A copy of the dissertation must be made available for review by the program doctoral faculty at least two weeks prior to the public defense.

A paper reporting results described in the dissertation shall be included in the dissertation (e.g. in an appendix). The paper may be published, accepted for publication, submitted for publication, or a draft following the guidelines of a journal to which the results will be submitted.

9. UNC Charlotte residency requirement.
The student must satisfy the UNC Charlotte residency requirement for the program by completing 20 hours, either as course work or research credits. Residence is considered to be continuous if the student is enrolled in one or more courses in successive semesters until 20 hours are earned.

10. Laboratory research rotations.
Laboratory research rotations allow the student to sample areas of research and become familiar with program faculty. Each student is to complete three rotations, each of two hours of course credit, during the first two years of the program. The three rotations must be done in at least two different departments.

The purpose of a laboratory rotation is to learn and perform techniques associated with the lab, and to potentially identify a Dissertation Advisor. A typical rotation will involve 5-10 hours per week in the laboratory. Generation of sufficient data to result in publication of a manuscript is not an expectation of a rotation experience. Students are encouraged to identify a sponsoring faculty member well in advance of the scheduled rotation.

11. Time limits for completion.
All requirements for the degree must be completed within eight years after first registration as a doctoral student. The student must achieve admission to candidacy within six years after admission to the program and complete all requirements within six years after admission to candidacy for the Ph.D. degree. These time limits are maximums; students will typically be expected to complete the degree requirements within five years.

COURSES IN BIOLOGY

BIOL 5000. Advanced Topics in Biology. (1-4)
Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the topics taught. May be repeated for credit as topics vary. (Fall, Spring)

BIOL 5110. Methods in Biological Electron Microscopy. (3) A laboratory-oriented course in the methodology and applications of transmission and scanning electron microscopy. Two laboratory periods of three hours each a week and three additional laboratory hours. (Fall)

BIOL 5111. Evolution. (3) Theories of evolution and forces which affect gene frequencies. (Fall)

BIOL 5121. Biometry. (4) Prerequisite: one course in statistics. Design and analysis of experiments. Three lecture hours and one laboratory period of three hours a week. (Spring)

BIOL 5144. Advanced Ecology. (4) Energy flow, nutrient cycles, community structure, population growth and regulation. Three lecture hours and one laboratory period of three hours a week. (Fall)

BIOL 5149. Limnology and Oceanography. (4) Geological, physical, chemical and biological aspects of lakes, streams, estuaries and oceans. Three lecture hours and one laboratory period of three hours a week. (Fall)

BIOL 5168. Recombinant DNA Techniques. (3) Modern molecular biological methods (such as DNA cloning, gel electrophoresis, nucleic acid hybridization, PCR, and DNA sequencing) data analysis and interpretation. One lecture hour and two laboratory periods of three hours a week. (Fall)

BIOL 5171. Cell Physiology. (3) The fundamental physicochemical properties of cells. (Fall)

BIOL 5184. Plant Biotechnology. (3) A laboratory-oriented course designed to integrate plant molecular biology, recombinant DNA technology, and plant cell and tissue culture. One lecture hour and two laboratory periods of three hours a week. (Spring) (Alternate years)

BIOL 5189. Mechanisms in Development. (3) Cellular and molecular bases of differentiation; an exploration of the experimental analysis of causal and controlling factors in development. (Spring)

BIOL 5199. Molecular Biology. (3) Structural and functional interaction of nucleic acids and proteins in the replication, transcription and translation of genetic material. (Fall)

BIOL 5205. Advanced Horticulture. (3) Topics in ornamental horticulture and landscaping, including greenhouse projects and field trips. Two lecture hours and three hours of lab a week. (Spring)

BIOL 5221. Plant Systematics. (4) Identification and classification of vascular plants, including experimental concepts of speciation. Three lecture hours and one laboratory period of three hours a week. (Spring)

BIOL 5223. The Fungi. (3) Morphology, life cycles, ecology, taxonomy, and medical economic significance of the fungi and organisms historically aligned with the fungi. (On demand)
BIOL 5223L. The Fungi Laboratory. (1) Co-
requisite/prerequisite: BIOL 5223; Consent of
department for graduate credit. One laboratory period of
three hours a week. (On demand)

BIOL 5229. Dendrology. (4) The identification,
structure, function, ecology, reproduction, and
evolutionary relationships of woody plants. Three lecture
hours and one three-hour lab a week. (Fall)

BIOL 5233. Parasitology. (4) Morphology, life cycles,
ecology, taxonomy and economic importance of
parasites. Three lecture hours and one laboratory period of
three hours a week. (Spring)

BIOL 5234. Wildlife Biology. (3) Concepts, principles
and techniques of wildlife biology. Identification and life
histories with emphasis on the value, study attraction,
management, conservation and control of wildlife species.
(On demand)

BIOL 5234L. Wildlife Biology Laboratory. (1)
Prerequisite or corequisite: BIOL 5234. One laboratory
period of three hours a week plus field trips. (Fall)

BIOL 5235. Mammalogy. (4) Taxonomy, anatomy,
physiology and life histories of the mammals. Three
lecture hours and one laboratory period of three hours a
week. (Spring)

BIOL 5236. Animal Behavior. (3) An ethological
approach to how animals respond to their environment.
Causation, development and adaptive significance of
behavior in social systems. (Fall)

BIOL 5236L. Animal Behavior Laboratory. (1)
Prerequisite or corequisite: BIOL 5236. One laboratory
period of three hours a week. (Fall)

BIOL 5244. Conservation Biology. (3) Conservation
values, extinction rates, genetic diversity, demography,
habitat fragmentation, reserve management, ecological
restoration. (Yearly)

BIOL 5244L. Conservation Biology Laboratory. (1)
Prerequisite or corequisite: BIOL 5244. One laboratory
period of three hours a week plus field trips. (Yearly)

BIOL 5250. Microbiology. (3) Morphology, physiology,
pathogenicity, metabolism and ecology of micro-
organisms. (Fall)

BIOL 5250L. Microbiology Laboratory. (1)
Prerequisite or corequisite: BIOL 5250. One laboratory
period of three hours a week. (Fall)

BIOL 5251. Immunology. (3) Cellular, molecular and
_genetic basis for immunity; physical chemistry of antigens
and antibodies and their interactions; defense
mechanisms. (Spring, Summer)

BIOL 5251L. Immunology Laboratory. (1)
Prerequisite or corequisite: BIOL 5251. One laboratory
period of three hours a week. (Spring)

BIOL 5252. Monoclonal Antibodies/Production and
Purification. (3) A laboratory-oriented course devoted
to the theory and procedures for the production and
utilization of monoclonal antibodies and the associated
techniques for protein isolation and characterization. One
lecture hour and two laboratory periods of three hours a
week. (Fall)

BIOL 5253. Marine Microbiology. (4) Bacteria, fungi
and viruses of marine origin, and their response to the
salt, temperature, pressure and nutrient environment of
the ocean. Roles of marine microorganisms in public
health, pollution and fouling. Three lecture hours and one
laboratory period of three hours a week. (Spring)

BIOL 5254. Epidemiology. (3) History and practices of
epidemiology with emphasis on modes of transmission of
clinically important infectious agents and the analysis of
epidemiological data. Three lecture hours a week. (On
demand)

BIOL 5255. Bacterial Genetics. (3) Regulation of gene
expression in bacterial systems. Bacteriophage genetics.
DNA transfer in bacteria. (Spring)

BIOL 5256. Pathogenic Bacteriology. (3) Cellular and
molecular interactions of mammalian hosts with
procaryotic parasites. (Fall)

BIOL 5256L. Pathogenic Bacteriology Laboratory.
(1) One laboratory period of three hours a week. (Fall)

BIOL 5257. Microbial Physiology and Metabolism.
(4) A laboratory-oriented course covering such topics in
general microbiology as the preparation and use of cell-
free systems, isolation of auxotrophs, transport
mechanisms, etc. Lectures in microbial metabolism and
physiology and reading on recent development in
microbiology. Two, one-hour lectures and two, two-hour
laboratory periods per week. (Spring)

BIOL 5259. Virology. (3) Morphology, classification,
genetics and pathogenicity of bacterial and animal viruses.
(Fall)

BIOL 5259L. Virology Laboratory. (1) Prerequisite or
corequisite: BIOL 5259. One laboratory period of three
hours per week. (Fall)

BIOL 5260. Population Genetics (3) The genetics of
qualitative and quantitative traits in populations, including
an assessment of the factors affecting the extent and
pattern of the genetic variation in these traits. (On demand)
BIOL 5277. Endocrinology. (3) Endocrine glands and their physiological roles in metabolism, growth and reproduction. (On demand)

BIOL 5277L. Endocrinology Laboratory. (1) Prerequisite or corequisite: BIOL 5277. One laboratory period of three hours a week. (On demand)

BIOL 5279. Neurobiology. (3) Physiology and anatomy of nervous systems, especially mammalian. (Spring)

BIOL 5279L. Neurobiology Laboratory. (1) Prerequisite or corequisite: BIOL 5279. One laboratory period of three hours a week. (Spring)

BIOL 5282. Developmental Plant Anatomy. (3) Study of plant cells, tissues, organs and patterns of growth and differentiation. (Spring)

BIOL 5282L. Developmental Plant Anatomy Laboratory. (1) Prerequisite or corequisite: BIOL 5282. One laboratory period of three hours a week. (Spring)

BIOL 5283. Animal Development. (3) Developmental processes occurring chiefly during gametogenesis, fertilization, early embryogenesis and organogenesis. (Fall)

BIOL 5283L. Animal Development Laboratory. (1) Prerequisite or corequisite: BIOL 5283. One laboratory period of three hours a week. (Fall)

BIOL 5291. Histology. (4) Animal tissues and organs; techniques of preparing tissues for analysis. Three lecture hours and one laboratory period of three hours a week. (Spring)

BIOL 5292. Advances in Immunology. (3) Current topics in immunology with particular emphasis upon the genetic systems and molecular mechanisms underlying immune reactions. (Fall)

BIOL 5293. Comparative Vertebrate Anatomy. (4) Prerequisite: BIOL 2111. Comparative studies of the anatomy, physiology and functional adaptations of selected vertebrates with emphasis on evolutionary developments, especially in mammals. Three lecture hours and one laboratory period of three hours a week. (Spring)

BIOL 6000. Special Topics in Biology. (1-4) Prerequisite: consent of department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6010. Special Topics in Microbiology. (1-4) Prerequisite: consent of department. Advanced courses in microbiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6020. Special Topics in Systematic Biology. (1-4) Prerequisite: consent of department. Advanced courses in systematic and evolutionary biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6030. Special Topics in Genetics. (1-4) Prerequisite: consent of department. Advanced courses in genetics. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6040. Special Topics in Molecular Biology. (1-4) Prerequisite: consent of department. Advanced courses in biochemistry and molecular biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6050. Special Topics in Physiology. (1-4) Prerequisite: consent of department. Advanced courses in physiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6060. Special Topics in Developmental Biology. (1-4) Prerequisite: consent of department. Advanced courses in developmental biology and embryology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6070. Special Topics in Anatomy. (1-4) Prerequisite: consent of department. Advanced courses in anatomy and morphology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6080. Special Topics in Behavior. (1-4) Prerequisite: consent of department. Advanced courses in behavior. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6090. Special Topics in Ecology. (1-4) Prerequisite: consent of department. Advanced courses in ecology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 6102. Cell and Molecular Biology. (4) Prerequisites: CHEM 6101, or consent of instructor. Structure of cellular components; the cell cycle; regulation of transcription, translation, and protein trafficking; cell membranes and transport; cell-cell communication, including signal transduction; extracellular matrix. Thirty two-hour lectures. (Fall)

BIOL 6103. Microbiology and Immunology. (4) Prerequisites: CHEM 6101 and BIOL 6102, or consent of instructor. Function and pathogenesis of prokaryotes, as
well as related aspects of host response. Microbial physiology with an emphasis on aspects relevant to pathogenesis; bacterial genetics with an emphasis on operons and regulons as model of control of bacterial gene expression; pathogenic microbiology with an emphasis on invasion and intracellular survival; immunology with an emphasis on the role of the immune response in resistance to infection. Thirty two-hour lectures. (Spring)

BIOL 6104. Integrative Systems Physiology. (4)
Prerequisites: CHEM 6101, BIOL 6102, BIOL 6103, or consent of instructor. The functioning of an intact mammalian organism with an emphasis on human physiology. Traditional survey of organ systems' functions, and problems of the response of cells within tissues to stress and their impact on organismal response. Thirty-two-hour lectures. (Spring)

BIOL 6100. Seminar. (1-2) Topics of current emphasis in biology. May be repeated for credit. (Fall, Spring)
BIOL 6800. Tutorial. (1-4) Directed study in areas of specialization in biology and related fields. Maximum credit toward degree: four hours. Offered on a Pass/No Credit or IP grading only. (Fall, Spring)

BIOL 6900. Research and Thesis. (1-8) Pass/No Credit or IP grading only. (Fall, Spring)

BIOL 7999. Master's Degree Graduate Residence. (1)

BIOL 8000. Special Topics in Biology. (1-4)
Prerequisite: consent of department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 8010. Special Topics in Microbiology. (1-4)
Prerequisite: consent of department. Advanced courses in microbiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 8030. Special Topics in Genetics. (1-4)
Prerequisite: consent of department. Advanced courses in genetics. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 8040. Special Topics in Molecular Biology. (1-4)
Prerequisite: consent of department. Advanced courses in biochemistry and molecular biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 8050. Special Topics in Physiology. (1-4)
Prerequisite: consent of department. Advanced courses in physiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. (On demand)

BIOL 8102. Cell and Molecular Biology. (4)
Prerequisites: CHEM 8101, or consent of instructor. Structure of cellular components; the cell cycle; regulation of transcription, translation, and protein trafficking; cell membranes and transport; cell-cell communication, including signal transduction; extracellular matrix. Thirty-two-hour lectures. (Fall)

BIOL 8103. Microbiology and Immunology. (4)
Prerequisites: CHEM 8101 and BIOL 8102, or consent of instructor. Function and pathogenesis of prokaryotes, as well as related aspects of host response. Microbial physiology with an emphasis on aspects relevant to pathogenesis; bacterial genetics with an emphasis on operons and regulons as model of control of bacterial gene expression; pathogenic microbiology with an emphasis on invasion and intracellular survival; immunology with an emphasis on the role of the immune response in resistance to infection. Thirty-two-hour lectures. (Spring)

BIOL 8104. Integrative Systems Physiology. (4)
Prerequisites: CHEM 8101, BIOL 8102, BIOL 8103, or consent of instructor. The functioning of an intact mammalian organism with an emphasis on human physiology. Traditional survey of organ systems' functions, and problems of the response of cells within tissues to stress and their impact on organismal response. Thirty-two-hour lectures. (Spring)

BIOL 8200. Interdisciplinary Colloquium. (1)
Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Discussion and analysis of topics of current emphasis in biomedicine and biotechnology. May be repeated for credit. Offered on a Pass/No Credit basis only. (Fall)

BIOL 8201. Seminar. (1) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Formal student presentations of current literature topics. May be repeated for credit. Offered on a Pass/No Credit basis only. (Spring)

BIOL 8800. Laboratory Rotations. (2) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Directed study in an area of specialization. May be repeated for credit. Offered on a Pass/No Credit basis only. (Fall, Spring, Summer)

BIOL 8999. Doctoral Dissertation Research. (0-9)
Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Individual investigation that culminates in the preparation and presentation of a doctoral dissertation. May be repeated for credit. Offered on a Pass/No Credit or IP basis only. (Fall, Spring, Summer)

BIOL 9999. Doctoral Degree Graduate Residence. (1)
CHEMISTRY

Department of Chemistry
Burson Building, Room 200
704-687-4765
http://www.chem.uncc.edu/grad/

Degrees
M.S.
Ph.D. Interdisciplinary degree in Biotechnology and BioMedicine
Ph.D. in Materials through Mechanical Engineering

Coordinator
Dr. Jordan C. Poler

Graduate Faculty
Banita W. Brown, Associate Professor
Brian T. Cooper, Assistant Professor
Bernadette T. Donovan-Merkert, Associate Professor
Thomas D. DuBois, Charles H. Stone Professor of Chemistry, Departmental Chair
Kenneth E. Gonsalves, Celanese Acetate Distinguished Professor of Polymer Chemistry
James W. Hovick, Assistant Professor
Daniel S. Jones, Associate Professor
Joanna K. Krueger, Assistant Professor
Craig A. Ogle, Professor
Jordan C. Poler, Associate Professor
Daniel Rabinovich, Associate Professor
Thomas A. Schmedake, Assistant Professor
John M. Risley, Professor
Wade N. Sisk, Associate Professor

Program of Study
The Chemistry Department offers a research-based Master of Science (M.S.) degree, which provides the background necessary for further graduate or professional studies in the physical, life or medical sciences or a career in. The M.S. degree requires a minimum of 30 credit hours and a thesis based on original research carried out under the direction of a member of the graduate faculty. Student participation in research activities is through selection of a faculty adviser and enrollment in the special research courses offered. Major emphasis is placed upon the research project and required thesis. UNC Charlotte B.S. degree chemistry majors may elect to participate in the five year Accelerated Early Entry M.S. program (described in the undergraduate catalog).

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Chemistry:

1) A satisfactory score on the Graduate Record Examination.
2) Administration of placement examinations by the department each semester just prior to registration as an aid in identifying academic deficiencies.
3) Removal of any deficiencies within one year.
4) A score of 220 (computer based) or better is required on the Test of English as a Foreign Language.

Degree Requirements
The candidate for the degree must present a minimum of 30 semester hours including at least 15 semester hours in 6000-level courses open to graduate students only. Required courses may include CHEM 3141, 3142, 5111, 5121, 5133, 5134, 5135 or 5165. Two semester hours of graduate seminar, CHEM 6681 and CHEM 6682, and at least one, but up to 16 semester hours of research and thesis credit, CHEM 6900, must be taken. In addition, six semester hours from the course group CHEM 6060, 6069, 6082, 6101, 6115, 6125, 6126, 6135, 6138, 6145, 6146, 6155, 6165, or MEGR 6109 or another course that has been approved by the Chemistry faculty, are required. Departmental approval is necessary before CHEM 6060 credit can be used to satisfy this requirement. Any 5000 level or higher Biology, Engineering, Mathematics or Physics course, except those designed for a professional education sequence, may be taken for graduate credit upon departmental approval. Well-prepared students, particularly those with degrees from ACS-approved programs, will normally satisfy the requirement for CHEM 3141, 3142, 5111, 5121, 5133, 5134, 5135 or 5165 through placement examinations administered after admission. In those cases, hours that would have been earned for these courses may be replaced by research, CHEM 6900, or by elective courses. A grade point average of 3.0 is required for the degree. An accumulation of two marginal (C) grades on the graduate transcript will result in termination of the student’s enrollment in the M.S. Program and a termination of any assistantships and fellowships they were receiving.

A student in the chemistry M.S. program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record. This review is performed by the departmental Graduate Committee.

Admission to Candidacy
An Admission to Candidacy form must be submitted approximately one month prior to the beginning of the semester in which the graduate student expects to complete all requisites for the M.S. degree.

Assistantships
Graduate students generally support their education through teaching or research assistantships available through the Chemistry Department. The department also sponsors the Gary Howard Research Fellowship competition, which provides significantly greater support to one highly qualified applicant. Tuition waivers are also available to external applicants through the Thomas Walsh Tuition Fellowships. Many faculty may offer
research assistantships to qualified students. Further information is available in the Department. Support in the summer months is also available.

Electives
Any 5000 level or higher Biology, Engineering, Mathematics or Physics course, except those designed for a professional education sequence, may be taken for graduate credit upon departmental approval.

Advising
Approval of the program of each student and monitoring his/her progress toward the degree is the responsibility of the student's research adviser. Prior to the selection of a research adviser, graduate student progress is monitored by the departmental Graduate Committee.

Thesis
A thesis must be written and defended within six calendar years after admission into the M.S. program as a degree student.

Thesis Committee
The written thesis is defended before the department and a special thesis committee of no fewer than four persons, with at least one member from outside of the Chemistry Department.

Application for Degree
The Application for Degree can be submitted on the form supplied by the Graduate School no later than the filing date specified in the University calendar.

Research Experiences
Chemistry faculty offer research opportunities in all areas of molecular and nanoscale sciences, and many participate in formal or informal interdisciplinary research programs. Faculty research interests include computational chemistry, organic synthesis, polymer chemistry, organometallic chemistry, structural and mechanistic organic chemistry, electrochemistry, materials and interfacial chemistry, catalysis, biochemistry, biophysical chemistry, analytical separations, bioanalytical chemistry, mass spectrometry, and chemical education. Many chemistry faculty are active participants in interdisciplinary research projects in biotechnology and biomedicine, optical science, materials science, or electrical engineering. Students receive academic credit for their research and benefit from a low student-to-faculty ratio. Graduate students are assigned individual projects and work closely with faculty members to build their own, original contribution to the scientific literature. Students have full access to and receive excellent training in the use of any departmental instrumentation needed to carry out their research. Results are presented at informal seminars, scientific conferences, and in articles published in high-quality, refereed journals. Research in the Department is funded in part from competitive grants obtained from agencies such as the American Chemical Society, National Science Foundation, National Institutes of Health, DoD, DoE, Research Corporation, Dreyfus Foundation, North Carolina Biotechnology Center, UNC Charlotte Foundation, and private industry.

Tuition Waivers
Thomas Walsh Tuition Fellowships are available for students enrolled in the Master's degree program in Chemistry and for students seeking an interdisciplinary Doctoral degree through the Chemistry Department. Further information is available in the Department.

COURSES IN CHEMISTRY

CHEM 5090. Special Topics in Chemistry. (1-4) Prerequisite: consent of the instructor. Selected topics in chemistry. Lecture and/or laboratory hours will vary with the nature of the course taught. May be repeated for credit. (On demand)

CHEM 5095. Topics for Teachers. (1-4) Prerequisite: consent of the instructor. Selected topics in chemical education. Lecture and/or laboratory hours will vary with the nature of the course taught. May be repeated for credit. (On demand)

CHEM 5111. Instrumental Analysis. (4) Prerequisites: Consent of the instructor. Selected modern instrumental methods of analysis, including theory and practice, with considerable attention given to the instrument and elementary electronics involved in the techniques. Two lecture hours and six hours of lab per week. (Spring)

CHEM 5121. Advanced Inorganic Chemistry. (4) Prerequisites: Consent of the instructor. Theoretical inorganic chemistry including the application of physicochemical principles to the study of inorganic systems. Laboratory work involves inorganic preparations and characterization techniques. Three lecture hours and one laboratory period of three hours a week. (Fall)

CHEM 5133. Methods of Organic Structure Determination. (2) Prerequisites: Consent of the instructor. Study and application of modern techniques, primarily spectroscopy, to determine the structure of organic molecules. One hour of lecture and one laboratory period of three hours each week. (Spring)

CHEM 5134. Organic Reaction Mechanisms. (2) Prerequisites: Consent of the instructor. Mechanistic and theoretical topics which are beyond the scope of CHEM 2131/2132, including orbital symmetry control of organic reactions, the Hammett Equation and other linear free energy relationships, heterocyclic compounds, polycyclic aromatic compounds, organic photochemistry, carbenes, nitrenes, arynes and other short lived, reactive intermediates. (Spring) (Alternate years)
CHEM 5135. Concepts and Techniques in Organic Synthesis. (2) Prerequisite or corequisite: CHEM 5133, or consent of the instructor. Modern techniques of organic synthesis. Laboratory includes one or more multi-step syntheses of complex molecules. One hour of lecture and one laboratory period of three hours each week. (Spring) (Alternate years)

CHEM 5165. Principles of Biochemistry I. (3)
Prerequisite: satisfactory score on an organic chemistry proficiency exam, or consent of the instructor. A study of the structures, properties, and functions of biological molecules, bioenergetics of biological reactions, and enzyme catalysis, with particular emphasis on the underlying chemical principles, including thermodynamics and kinetics. (Fall)

CHEM 5165L. Principles of Biochemistry I Laboratory. (1) Prerequisite or corequisite: CHEM 5165. Physical properties of biological molecules and an introduction to experimental techniques of biochemical research. Eleven four-hour lab periods. (Fall)

CHEM 5166. Principles of Biochemistry II. (3)
Prerequisite: CHEM 5165 with a grade of B or better. A study of various metabolic pathways and information transfer including molecular aspects of cell biology and genetics, with particular emphasis on the underlying chemical reactions, including thermodynamics and kinetics. (Spring)

CHEM 5167. Structure and Mechanism in Protein Chemistry. (3) Prerequisites: CHEM 5165, and either CHEM 5166 or BIOL 5171, or consent of the instructor. Examination of structures, properties, and functions of proteins, enzyme catalysis, and bioenergetics, emphasizing underlying mechanistic chemical and biochemical principles. (Spring) (Alternate years)

CHEM 5171. Biochemical Instrumentation. (4)
Prerequisites: CHEM 5165 and 5165L with a grade of B or better or the consent of the department. Modern instrumental methods used in biorelated areas such as biochemistry, biotechnology and medical technology. Theory and practice. Potentiometry, spectrophotometry, chromatography, sedimentation, and electrophoresis. Two lecture hours and two three-hour laboratory periods per week. (Spring)

CHEM 5175. Physical Biochemistry. (3) Prerequisites: CHEM 5165, 5165L, and 5166, with a grade of B or better, or consent of the instructor. Colloid systems, equilibria in biological fluids, mass and energy transport in fluids and in association with membranes, energy storage and dissipation with relation to specific chemical bonding, enzyme kinetics. (On demand)

CHEM 5185. Chemical Fate of Pollutants. (3)
Prerequisites: satisfactory score on chemistry proficiency exam, or consent of the instructor. Chemical reactivity and fate of pollutants (in air, water, soil) in terms of their chemical structure and energetics, mechanisms, structure/energy relationships and their interaction with reactive environmental species including light. (Spring) (Alternate years)

CHEM 5200. Computational Chemistry. (4)
Prerequisite or corequisite: Consent of instructor. Electronic and molecular mechanics-based computational methods, including properties, optimized equilibrium and transition state structures and potential energy surfaces of reactions. Three lecture hours and three hours of laboratory each week. Additional projects required of graduate students. (Fall, Spring)

CHEM 6060. Special Topics and Investigations. (1-3)
Prerequisite or corequisite: CHEM 5165 or consent of instructor. Study of various topics in current chemical interest. May be repeated for credit. (On demand)

CHEM 6069. Topics in Biochemistry. (3)
Prerequisites: CHEM 6165, or consent of instructor. Discussion of current topics in biochemistry emphasizing their biomedical/biotechnological aspects from bioinorganic chemistry, bioorganic chemistry, bioanalytical chemistry, biophysical chemistry, biocomputational chemistry, biomaterials. May be repeated for credit. Three lecture hours per week. (Spring)

CHEM 6082. Surfaces and Interfaces of Materials Chemistry. (3) Prerequisites: Any three semesters of undergraduate calculus based mathematics (i.e., MATH 1241, 1242, and 2241) and an upper level undergraduate course in thermodynamics (i.e., CHEM 3142, PHYS 3151 OR MEGR 3112) or consent of the instructor. Theoretical basis, conceptual understanding and experimental investigations of the properties of surfaces and interfaces of various classes of materials will be presented. The content of this course will build from a rigorous derivation of the physical chemistry of surfaces and interfaces to a discussion of topical materials classes and specific materials properties. Three lecture hours each week. (Alternate years)


CHEM 6115. Advanced Analytical Chemistry. (3) Prerequisite: CHEM 5111 with a grade of B or better, or consent of the instructor. The application of modern analytical methods to chemical problems. Emphasis is upon the chemical information, particularly structural, obtainable from these techniques. (On demand)
CHEM 6125. Theoretical Inorganic Chemistry. (3) 
Prerequisite: CHEM 5121 with a grade of B or better, or consent of the instructor. Group theoretical treatment of current theories of inorganic chemistry. Topics covered: Ligand field theory, molecular orbital theory for complex ions, electronic spectra of complex ions and the magnetic properties of complex ions. (On demand)

CHEM 6126. Organometallic Chemistry. (3) 
Prerequisites: Consent of instructor. Previous or concurrent enrollment in CHEM 5133 recommended. Synthesis, structure, characterization, and reactivity of organometallic compounds; introduction to catalysis and bioorganometallic chemistry. Three lecture hours each week. (On demand)

CHEM 6135. Advanced Organic Chemistry. (3) 
Prerequisite: CHEM 5133 and either 5134 or 5135 with a grade of B or better, or consent of the instructor. A qualitative discussion of modern mechanistic interpretation of the relations between structure and reactivity. Special emphasis is placed on the role of reactive intermediates such as carboxonium ions, carbanions, carbines and radicals. (Alternate years)

CHEM 6138. Stereochemistry. (3) Prerequisite: Advanced course in Biochemistry or Organic Chemistry. Three-dimensional chemistry and its chemical, physical and biochemical consequences, emphasizing classification of isomers and stereoisomers and the consequences of molecular shape on chemical and biological properties. (Spring) (Alternate years)

CHEM 6145. Chemical Thermodynamics. (3) 
Prerequisite: Consent of the instructor. The postulatory basis of classical thermodynamics. Problems in chemical thermodynamics. The use of statistical mechanics for calculating thermodynamic functions. (On demand)

CHEM 6146. Rates and Mechanisms. (3) Prerequisite: Consent of the instructor. Consideration of chemical kinetics and mechanism schemes, particularly those of current interest. (On demand)

CHEM 6150. Seminar-Internship. (1-3) Prerequisite: Consent of the instructor. Required for all teaching assistants. Supervised experience in the teaching of college chemistry. Graded Pass/No Credit. May be repeated for credit. (Fall, Spring)

CHEM 6155. Polymer Synthesis. (3) Prerequisite: Consent of the instructor. Polymer structure, classification of polymerization reactions, theory and practice of step growth polymerization, radical, ionic and ring opening polymerizations, polymerization by transition metal catalysts. Recent advances in polymer synthesis. Three lecture hours per week. (On demand)

CHEM 6165. Advanced Biochemistry. (3) 
Prerequisites: CHEM 6101, BIOL 6102, 6103, 6104, or consent of instructor. Advanced course on protein structure, enzyme and mechanistic biochemistry, metabolic biochemistry, biophysical chemistry. Three lecture hours per week. (Spring)

CHEM 6681. Research Seminar. (1) Prerequisite: consent of the instructor. Individual investigation and exposition of the results. (Fall, Spring)

CHEM 6682. Research Seminar. (1) Prerequisite: consent of the instructor. Individual investigation and exposition of the results. May be repeated for credit. (Fall, Spring)

CHEM 6900. Research and Thesis. (1-16) Prerequisite: consent of the instructor overseeing thesis research. Laboratory research for the thesis. (Fall, Spring, Summer)

CHEM 7999. Graduate Residence. (1) Prerequisite: consent of the instructor overseeing thesis research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. (Fall, Spring)

CHEM 8069. Topics in Biochemistry. (3) 
Prerequisites: CHEM 6165, or consent of instructor. Discussion of current topics in biochemistry emphasizing their biomedical/biotechnological aspects from bioinorganic chemistry, bioorganic chemistry, bioanalytical chemistry, biophysical chemistry, biomaterials. May be repeated for credit. Three lecture hours per week. (Spring)

CHEM 8101. Biochemical Principles. (3) 
Prerequisites: Admission to Ph.D. program or consent of instructor. Molecular biophysics of biological molecules. Bioenergetics of biological reactions and enzyme structure, mechanisms, and regulation. Metabolic pathways and the role of cellular organelles. Biochemical analysis methodology. Twenty-three two-hour lectures. (Fall)

CHEM 8155. Polymer Synthesis. (3) Prerequisite: Admission to Ph.D. program or consent of instructor. Polymer structure, classification of polymerization reactions, theory and practice of step growth polymerization, radical, ionic and ring opening polymerizations, polymerization by transition metal catalysts. Recent advances in polymer synthesis. The course will require a "Research Proposal". This will include a presentation in class as well as a ten page prospectus style manuscript. Three lecture hours per week. (On demand)

CHEM 8165. Advanced Biochemistry. (3) 
Prerequisites: CHEM 8101, BIOL 8102, 8103, 8104. Advanced course on protein structure, enzyme and mechanistic biochemistry, metabolic biochemistry, biophysical chemistry. Three lecture hours per week. (Spring)
COMMUNICATION STUDIES

Department of Communication Studies
317 Admissions Building
704-687-4005

Degree
M.A., Certificate

Coordinator
Dr. Jonathan Crane

Graduate Faculty
Jonathan Crane, Associate Professor
Barbara DeSanto, Associate Professor
Darlene Drummond, Assistant Professor
Alan Freitag, Assistant Professor
Bill Hill, Professor
David Hoffman, Assistant Professor
Richard Leeman, Associate Professor
Shawn Long, Assistant Professor
Gaelle Picherit-Duthler, Assistant Professor
Denise Trauth, Professor

MASTER OF ARTS

Program of Study
The Master of Arts in Communication Studies at the University of North Carolina is designed to provide advanced study in the field of communication. The program emphasizes the ability to understand and analyze communication practices in the 21st Century. The curriculum is broad based, and includes opportunities to study the theory and practice of communication in the areas of organizational communication, public relations, mass media, and health communication.

Additional Admission Requirements
GRE, personal statement, three letters of recommendation

Degree Requirements
The Master of Arts degree program in Communication requires the completion of thirty credit hours of graduate work in Communication. The program requires the completion of COMM 6100, COMM 6101, twelve hours of elective course work in Communication Studies, six credit hours of approved study in a cognate area and six hours of research requirements. No more than 6 credit hours may be taken at the 5000 level. Successful completion of the program requires a minimum GPA of 3.0.

GRADUATE CERTIFICATE

Communication Studies

Coordinator
Dr. Jonathan Crane

Graduate Faculty
Jonathan Crane, Associate Professor
Barbara DeSanto, Associate Professor
Darlene Drummond, Assistant Professor
Alan Freitag, Assistant Professor
Bill Hill, Professor
David Hoffman, Assistant Professor
Richard Leeman, Associate Professor
Shawn Long, Assistant Professor
Gaelle Picherit-Duthler, Assistant Professor
Denise Trauth, Professor

Program of Study
The Graduate Certificate in Communication Studies is designed to provide advanced study in the field of communication. The program emphasizes the ability to understand and analyze communication practices in the 21st century. The curriculum is broad based, and includes opportunities to study the theory and practice of communication in the areas of organizational communication, public relations, mass media, and health communication.

Additional Admission Requirements
GRE, personal statement, three letters of recommendation.

Certificate Requirements
Fifteen credit hours in graduate communication courses, including Comm 6100, with no more than six credit hours at the 5000 level.

Core Course
Comm 6100 Communication Research Methods

Advising
Contact the Graduate Coordinator.

COURSES IN COMMUNICATION

COMM 5101. Media and the Law. (3) Survey of legal rights, restrictions, and ethical considerations in field of communication including the First Amendment, libel, invasion of privacy, obscenity law, regulation of electronic
media, relationships between media and judiciary.  *(Fall, Spring)*

**COMM 5102. Federal Interpretation of the First Amendment.** *(3)* In-depth case analysis of tests determining Constitutional boundaries of expression including clear and present danger, prior restraints, fighting words/symbolic speech, strict scrutiny, obscenity, indecency. *(On Demand)*

**COMM 5141. Advanced Organizational Communication.** *(3)* Critical examination of the communication practices of organizations which accomplish such tasks as establishing organizational identification, influencing organizational members, and making decisions. Includes application of research methods to assess and analyze an organization’s communication practices. *(Fall, Spring)*

**COMM 6000. Topics in Communication Studies.** *(3)* Intensive investigation of a timely and important topic in communication studies. The topic of investigation may vary from semester to semester. May be repeated for credit with permission of graduate advisor. *(On demand, Evenings)*

**COMM 6100. Communication Research Methods.** *(3)* Methods for systematic investigation of communication behavior. Theoretical and practical applications of both qualitative and quantitative research methodologies are utilized for completion of original projects. *(Spring, Evenings)*

**COMM 6101. Contemporary Viewpoints in Communication Theory.** *(3)* A survey of the leading theoretical traditions in communication studies. Covers both qualitative and quantitative approaches to conceptualizing communication practices. *(Fall, Evenings)*

**COMM 6110. Advanced Persuasion.** *(3)* Analysis of theories of persuasion as a mode of social influence. Focus on the understanding and analysis of how persuasion works in various communicative contexts including mass-mediated, public relations, organizations and public advocacy. *(On Demand, Evenings)*

**COMM 6120. Communication and Network Society.** *(3)* Examines the social dynamics arising from the global embrace of revolutionary communication technologies. Topics include the forces that shape new information flows and the effects emergent technologies exert across nations, local communities and individuals. *(On Demand, Evenings)*

**COMM 6121. Communication and the Internet.** *(3)* This course considers the Internet as a social, cultural and political phenomenon. It will study and debate the competing visions of how the Internet does, can and should play a role in reshaping society. It will explore how the computer and network technologies shape communities as well as individual identities. The course will also address questions of law and public policy connected to issues of access, intellectual property and censorship. *(On Demand, Evenings)*

**COMM 6120. Communication and Network Society.** *(3)* Examines the social dynamics arising from the global embrace of revolutionary communication technologies. Topics include the forces that shape new information flows and the effects emergent technologies exert across nations, local communities and individuals. *(On Demand, Evenings)*

**COMM 6130. Textual Analysis.** *(3)* The application of qualitative methods of language and rhetorical analysis to communication artifacts. The course uses a seminar approach to learn close textual analysis. Methodologies include dramatic, situational analysis, genre, metaphor, perspectival and postmodern paradigms. *(On Demand, Evenings)*

**COMM 6141. Organizational Communication Case Studies.** *(3)* Communication theories are applied to real and fictional organizational cases. Topics such as culture, diversity, change, networks, and diffusion of innovations are examined from a communication perspective. *(Yearly, Evenings)*

**COMM 6145. Communication Campaign Management.** *(3)* A blending of theory and application to public relations/communication campaigns. The application dimension stresses mastery of the technical aspects of the campaign: research, problem-solving, planning, evaluation, and teamwork. The theoretical dimension stresses the study of actual campaigns and formulating generalizations regarding their successes or shortcomings. Class members serve on account teams with the instructor as manager. Account teams represent real-world clients and prepare a campaign book for the client’s later implementation. *(Yearly, Evenings)*

**COMM 6146. Media Relations.** *(3)* This course will draw on academic and professional research to study the communication strategies and tactics associated with establishing and maintaining effective relations between public relations practitioners and the media. *(Yearly, Evenings)*

**COMM 6170. Communication Law and Policy** *(3)* Survey of legal rights, legal restrictions, and policy developments governing public communication in the United States. *(On Demand) (Evenings)*

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**CRIMINAL JUSTICE**

**Department of Criminal Justice**
226 Garinger Building
704-687-2652

**Degree**
M.S.

**Coordinator**
Dr. Anita Blowers
**Graduate Faculty**

Bruce Arrigo, Professor  
Beth Bjerregaard, Associate Professor  
Anita Blowers, Associate Professor  
Pauline Brennan, Assistant Professor  
Charisse Coston, Associate Professor  
Charles Dean, Professor  
M. Lyn Exum, Assistant Professor  
Paul Friday, Professor  
David Hirschel, Professor Emeritus  
Vivian Lord, Associate Professor

**Program of Study**

The Master of Science degree program in Criminal Justice is designed to promote broad based study of the phenomenon of crime and to enhance career opportunities in the field of criminal justice. The program utilizes the social and behavioral sciences in an interdisciplinary approach to study law, crime, and social deviance, and to examine critically the systems created in response to deviance and crime. The objectives of the program are to: (1) provide present and future criminal justice personnel with the educational background necessary to function effectively in the dynamic field of criminal justice; (2) familiarize students with the nature, methods, and functions of research, and with the existing body of knowledge on criminal justice; (3) provide the criminal justice system with qualified candidates for careers in the field; and (4) prepare students for entrance into doctoral programs. Career opportunities available in the criminal justice system include law enforcement, corrections, administration, planning and analysis, juvenile justice, and college instruction. There are also private sector careers available, including private security. Students may enroll in the program on either a full-time or part-time basis. Many classes are scheduled in the evening to accommodate the part-time student.

**Additional Admission Requirements**

Admission to the Criminal Justice graduate program is open to students with bachelor's degrees in any discipline who meet the general requirements for admission to the Graduate School, provided they meet the following requirements. Applicants must have a grade point average of at least 2.75, a satisfactory score on the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT) and strong recommendation letters.

**Degree Requirements**

A minimum of 36 semester hours is required. Eighteen of these 36 hours must be in courses open only to graduate students (6000 level and above). All students must complete each of the following five core courses with a grade of B or above: CJUS 6100 (The Criminal Justice System); CJUS 6101 (The Nature and Theory of Crime); CJUS 6102 (Research in Criminal Justice I); CJUS 6103 (Research in Criminal Justice II); and CJUS 6104 (Criminal Justice and Social Control). A maximum of 12 hours may be taken outside the Criminal Justice Department, and a maximum of six hours with grades of B or above may be transferred from another institution. Transfer courses must be consistent with the program and will be accepted at the discretion of the department. At least 30 semester hours must be taken in residence. In addition to the above course work, all students are expected to successfully pass a qualifying exam. This exam is to be taken after the student has completed all required courses and before they complete more than 21 hours of course work. Additionally, students must complete either a thesis (6 hours) or an applied research project (3 hours).

**Assistantships**

The Criminal Justice Department offers graduate assistantships which are awarded solely on the basis of academic merit.

**Financial Aid**

In addition to the graduate assistantships, the department offers, as available, research assistantships and grant-funded opportunities for students. In addition, the competitive Dean Reep Scholarship is available for an incoming graduate student each year.

**Qualifying Examination**

The qualifying examination is offered each Fall and Spring semester. Anyone who has successfully completed 15 semester hours, including passing all five core courses with B or above, is eligible to take the examination. The comprehensive examination may be taken no more than two times.

**Courses in Criminal Justice**

**CJUS 5000. Topics in Criminal Justice.** (3) Specialized criminal justice topics. May be repeated for credit. (Fall, Spring)

**CJUS 5101. Drugs, Crime and the Criminal Justice System.** (3) Use of drugs and their relationship to crime including the impact of drugs on the individual and the criminal justice system. (On demand)

**CJUS 5103. International Criminal Justice.** (3) Examination of international patterns of crime and the criminal justice systems of the United States and other nations. (On demand)

**CJUS 5160. Victims and the Criminal Justice System.** (3) Relationship between victims of crime and the criminal justice system. Specific topics include an analysis of the characteristics of crime victims, victim reporting patterns, treatment of victims by the various segments of the criminal justice system, victim assistance programs, and the issue of compensation and/or restitution for victims of crime. (On demand)

**CJUS 5161. Violence and the Violent Offender.** (3) Issues surrounding violence in today's society and their
impact on offenders involved in homicide, child and domestic abuse, and other forms of violence.
Examination of myths about violence, victim-offender characteristics and relationships, and theories of violence. (On demand)

CJUS 5162. Sexual Assault. (3) Comprehensive and critical examination of sexual exploitation in the United States. (On demand)

CJUS 6000. Topics in Criminal Justice. (3-6)
Specialized criminal justice topics. May be repeated for credit. (On demand)

CJUS 6100. Criminal Justice Policy. (3) Examination of the criminal justice subsystems (law enforcement, courts, corrections) with particular focus on the development of policy and the effectiveness of current policies aimed at reducing crime. (Fall)

CJUS 6101. The Nature and Theory of Crime. (3) Definitions and patterns of criminal behavior. Major theoretical perspectives on crime, including historical, philosophical, individual, community-oriented and societal approaches. (Fall)

CJUS 6102. Research in Criminal Justice I. (3) Introduction to research methodology and statistics with emphasis on applications to criminal justice settings. Topics to be covered include problem selection, theory, hypothesis formulation, research design, sampling, measurement and proposal writing. (Spring)

CJUS 6103. Research in Criminal Justice II. (3) Prerequisite: CJUS 6102. Advanced research methodology with emphasis on conducting, presenting and evaluating research in criminal justice settings. Topics to be covered include data collection, data input, data analysis, and interpretation. (Fall)

CJUS 6104. Criminal Justice and Social Control. (3) Examines how the law functions as a powerful tool of social control in our society. Particular emphasis is given to understanding the constitutional limitations placed on the construction of law, the elements of criminal offenses, and criminal defenses. (Spring)

CJUS 6120. Criminal Justice Management and Decision-Making. (3) Application of generic principles of management and supervision to operational problems confronted by criminal justice agencies with particular attention to decision-making and discretion in criminal justice settings. (On demand)

CJUS 6130. Law Enforcement Systems. (3) Consideration of the elements of law enforcement agencies as subsystems of the total criminal justice system. Comparisons of law enforcement systems in other countries is also considered. (On demand)

CJUS 6131. Police Problems and Practices. (3) Research on current issues in law enforcement with emphasis on the legal, social, and institutional contexts in which they occur. (On demand)

CJUS 6132. Legal Issues in Law Enforcement. (3) Law applicable to the functions of police administrators and line police officers including constitutional, statutory, judicial, and administrative law governing search and seizure, arrest, interrogation, use of force, jurisdiction, civil and criminal liability of administrators and officers, and the rights of officers and suspects. (On demand)

CJUS 6140. Prosecution and Adjudication Processes. (3) Functions and powers of prosecutors, defense attorneys, judges and juries including plea bargaining and court procedure. (On demand)

CJUS 6150. Corrections. (3) Functions of correctional agencies, principles of punishment and a historical analysis of correctional institutions and programs including prisons, jails, probation and parole systems. (On demand)

CJUS 6151. Correctional Strategies: Rehabilitation and Reintegration. (3) Efforts to change offender behavior and to facilitate the development of offender-community linkages. Institutional classification and treatment strategies, pre-release and temporary release programs, innovative uses of probation and parole systems, community residential programs and new dispositional models; e.g., sentencing to community service and restitution. (On demand)

CJUS 6152. Legal Issues in Corrections. (3) Major legal issues pertaining to corrections, including sentencing, probation, restitution, prisons, parole, pardon and restoration of rights with emphasis on legal issues often confronted by correctional administrators and probation and parole personnel. (On demand)

CJUS 6160. Juvenile Justice Systems. (3) The process by which specific behaviors are identified as delinquent and the responses of the juvenile justice system to such behaviors. Laws dealing with the juvenile justice system, the historical development of the system, and the effectiveness of innovative responses to delinquency. (On demand)

CJUS 6170. Program Planning and Evaluation in Criminal Justice. (3) Applied research as a foundation for criminal justice planning and evaluation. Emphasis on the interrelationship of planning and evaluation within program management. (On demand)

CJUS 6800. Directed Individual Study in Criminal Justice. (3) Supervised investigation of a criminal justice problem of special interest to the student. May be repeated one time with the approval of the student's
CJUS 6901. Thesis I. (3) Students taking this course will work on developing a research proposal of a significant criminal justice topic approved by the student’s thesis committee. The final proposal will include an extensive literature review and a detailed discussion of the research plan. Graded credit/no credit. (Fall, Spring, Summer)

CJUS 6902. Thesis II. (3) Prerequisite: CJUS 6901. Students taking this course will conduct independent research developed in CJUS 6901, successfully defend the research in an oral defense meeting, and have the final written thesis approved by the graduate school. Graded credit/no credit. (Fall, Spring, Summer)

CJUS 7999. Graduate Residence (1) Continuation of work for the thesis or comprehensive exam. (Fall, Spring, Summer)

EARTH SCIENCES

Department of Geography and Earth Sciences
448 McEniry Building
704-687-2295
http://www.uncc.edu/colleges/arts_and_sciences/geoearth/

Degree
M.S.

Coordinator
Dr. John F. Bender

Graduate Faculty
Craig Allan, Associate Professor
John Bender, Professor
Andy Bobyarchick, Associate Professor
John Diemer, Associate Professor
Randall Forsythe, Associate Professor
Hilary Inyang, Professor
Susan Marshall, Associate Professor
Walter Martin, Associate Professor
William Toole, Lecturer (Attorney)

Program of Study
The Master of Science in Earth Sciences offers interdisciplinary study in the areas of geology, hydrology, atmospheric science and environmental science. M.S. candidates will develop the required analytical and conceptual skills necessary in a modern earth science career. Students have the opportunity to acquire an in-depth understanding of the origin, structure and evolution of the earth and its atmosphere and hydrosphere. In the process, students learn to conceptualize the earth as a dynamic system.

The local area served by UNC Charlotte is the largest metropolitan region in the Carolinas and is a center for environmental consulting and regulatory activities. Recent growth has resulted in issues of concern including supply and contamination of surface and groundwater resources, atmospheric pollution, site assessments, perturbation of geochemical systems, soil erosion and sedimentation, and mining practices and resources. Continued growth in the region in the near future will increase the magnitude and complexity of problems related to these issues. The program is designed to address these needs and to be completed in two years of full-time study. Graduates of the program will employ their expertise in a wide variety of activities and will be prepared for careers such as environmental consultants, natural resource exploration and extraction geologists in the energy and mining industries, regulators in governmental agencies, students in doctoral programs, and earth science teachers in secondary schools. Graduates will acquire the knowledge to be able to make informed decisions concerning earth resources, both as scientists and as citizens. The masters program is also designed to accommodate earth scientists and educators already in the work force who may wish to upgrade their academic credentials and complete the program of study on a part-time basis.

The M.S. in Earth Sciences emphasizes the application of earth science methodology and theory to problem solving. To this end, students are offered a solid foundation in earth science concepts, research methodology, quantitative methods and computer applications including Geographic Information Systems (GIS) and remote sensing technology.

One of the program's greatest strengths is the high faculty to student ratio and close relationship between its students and faculty. Small class sizes, close student and faculty contact and a strong sense of community are considered essential components of the learning and teaching environment in the Department.

Additional Admission Requirements
It is the policy of the Department to provide equal opportunities to all students regardless of race, creed, color, sex, or national origin. The Department requires applicants to demonstrate evidence of suitability for the program.

All applications for admission are reviewed by the Earth Sciences Graduate Committee. The Department admits applicants on a competitive basis as space in the program allows.

1) Grade Point Average (GPA): The Department expects an overall GPA of at least 2.75 (3.0 for junior and senior years). However, exceptions may be made if the other elements of the application are strong.
2) Letters of Recommendation: Three letters of reference are required. Letters from college or university teachers who have worked with and/or taught applicants are preferred. These letters are evaluated on the basis of how well the applicant is suited in terms of intellect, preparation and motivation to perform graduate work.

3) Personal Essays: Applicants must write a personal essay which directly addresses reasons for the desire to conduct graduate work in earth sciences as well as the desire to participate in the M.S. program at UNC Charlotte. Applicants should comment on their expectations regarding the benefits of an M.S. in Earth Sciences. Lastly, applicants should address directly how the program at UNC Charlotte fits their career and/or professional goals and how they would benefit from and contribute to the MS in Earth Sciences at UNC Charlotte. The essay is very important in determining the applicant's commitment to graduate education and to a professional career in earth sciences or a related field. Careful preparation of the essay is time well spent.

4) Scores on the Graduate Record Exam: In general the Department expects minimum scores of 1000 on the combined verbal and quantitative portions of the Graduate Record Exam. Lower scores will not automatically exclude applicants if the remainder of the applicant's file is strong.

5) Transcripts of College Course Work: The transcripts are evaluated on the basis of performance in a range of earth sciences, physical sciences and mathematics courses in order to determine the applicant's preparation for graduate level course work.

Additional Requirements for International Applicants:
Applicants whose native language is not English must score at least 550 (paper based) or 220 (computer based) on the Test of English as a Foreign Language (TOEFL). Scores on the Graduate Record Exam: In general the Department expects minimum scores of 1000 on the combined verbal and quantitative portions of the Graduate Record Exam. Lower scores will not automatically exclude applicants if the remainder of the applicant's file is strong.

Prerequisite Requirements
Minimum Requirements for Students Entering the Program:
All prospective graduate students must demonstrate competence in undergraduate subject matter in their area of study. While the Department does not require that applicants have a degree in Earth Sciences, prospective graduate students should provide evidence that they are prepared to immediately take full advantage of graduate level course work in Earth Sciences.

Students applying to the program should, at a minimum, be familiar with the concepts and materials offered in courses such as: Physical Geography, Physical Geology, Earth History, Introductory Chemistry, Introductory Physics, and calculus-based Mathematics. These courses or their equivalents are required for admission to the UNC Charlotte M.S. in Earth Sciences program. Courses in Computer Sciences are also considered important. Any student wishing to pursue additional training in Geographic Information Systems (GIS) should have basic cartography preparation and computer file management and data base skills.

All decisions concerning the equivalency of courses in an applicant’s transcript to those listed as minimum requirements for entry in the M.S. in Earth Sciences are the responsibility of the Graduate Committee and the Department Chair.

Degree Requirements
The program requires a minimum of 36 hours of graduate credit. Up to six graduate credits may be accepted as transfer credit. Only courses with grades of A or B earned in an accredited graduate program are eligible. Transfer credits are not automatic and require the approval of the Graduate Coordinator. The amount of transfer credit may not exceed the limit set by the Graduate School (6 hours).

A student is expected to achieve A’s or B’s in all course work taken for graduate credit and must have at least an average of B (3.0) in order to graduate. A grade of “C” in any course will result in the student being placed on academic probation. An accumulation of more than two marginal “C” grades will result in termination of the student’s enrollment in the graduate program. A grade of “U” will result in the immediate termination of that student's enrollment in the graduate program. Readmission to the program would require approval of the Graduate Coordinator, Department Chair and Dean of the Graduate School.

The student must complete at least 18 of the 36 credit hours in courses at the 6000-level or above. Of these at least nine credits will consist of 6000-level applied research. Students can select one of three options: 1) a 9-credit research thesis; 2) a community/industry based 9-credit internship; or 3) two or three faculty directed research projects ranging from 3 to 6 credits each. Students also must pass a two-part comprehensive examination covering 1) general aspects of the Earth Sciences discipline, and 2) a defense of one research project before receiving the M.S. degree.

Elective Courses
We anticipate that students will select electives from among civil engineering, biology, chemistry, physics and geography courses in support of particular emphases within our program. For example, certain geotechnology or waste disposal courses in Civil Engineering may be appropriate for the student pursuing problems in environmental earth sciences. Students engaged in the effect of physical earth sciences processes on the biosphere may include in their program of study ecology or botany courses in biology or organic chemistry courses in the Chemistry Department.

Admission to Candidacy Requirements
An application for admission to candidacy should be filed upon successful completion of a minimum of 18 semester hours of graduate work and no later than four weeks...
prior to the beginning of the semester in which the student expects to complete all requirements for the degree. Completed forms should be forwarded to the Graduate School.

**Assistantships**
Assistantships are much like a part-time job for the student. As we try to find work settings that fit the student's academic interest, these assistantships can also offer valuable training opportunities and work experience. The nature of a research assistantship depends entirely on the needs of the supervising faculty member. Teaching assistantships are assigned on the basis of the student's academic background.

Graduate assistantships are arranged for either one entire semester or for an entire academic year (2 semesters or 9 months). They are normally scheduled for 16 weeks per semester and the student is expected to work 20 hours per week. The Department makes every effort to provide funding to every full-time student in the program.

**Concentration Descriptions and Courses**
The concentrations are Solid Earth Sciences, Climatology and Hydrology, and Environmental Systems Analysis.

This graduate program follows a traditional numbering scheme with both 5000 and 6000 level courses. The 5000 level numbers identify courses that cover accepted bodies of knowledge within the earth sciences with the emphasis placed on mastery and critical assessment of the theoretical and empirical foundations within the discipline. The 6000 level courses are divisible into two categories. The first category is the Earth Systems topic courses wherein graduate students review and analyze the dominant current working hypotheses that drive contemporary research within conceptual areas such as geodynamics, global biogeochemical cycles, or climate change. The second 6000 level category is the directed research courses. This category provides the framework for graduate students to complete the research requirements within the program and also identifies the area of concentration of the directed research. This framework permits the assignment of appropriate faculty for research supervision. There are no specific course requirements for the three concentration areas.

**Solid Earth Sciences**

**Overview**
The Solid Earth Sciences concentration offers course work in Environmental Geology, Geochemistry, Geologic Mapping, Geomorphology, Hydrogeology, Mineralogy, Petrology, Remote Sensing, Sedimentology, Stratigraphy, Structural Geology, and Tectonics.

This concentration prepares students for licensure as Professional Geologists and for employment in the environmental consulting, energy and mining industries as well as government agencies charged with assessing natural resources and monitoring their utilization. The concentration also prepares those students who choose to undertake further graduate study or become earth sciences teachers.

**Course Work**
The following courses are available in the concentration in Solid Earth Sciences:
- ESCI 5170 Fundamentals of Remote Sensing
- ESCI 5180 Digital Image Processing in Remote Sensing
- GEOL 5100 Igneous and Metamorphic Petrology
- GEOL 5105 Geomorphology
- GEOL 5110 Stratigraphy
- GEOL 5115 Applied Geophysics
- GEOL 5120 Geologic Mapping and Interpretation
- GEOL 5125 Geologic Summer Field Camp
- GEOL 5130 Optical Mineralogy
- GEOL 5135 Tectonics
- GEOL 5145 Fundamentals of Hydrogeology
- GEOL 5165 Aqueous Geochemistry
- GEOL 5175 Geochemistry
- GEOL 5185 Mineralogy, Economics and the Environment
- GEOL 6101 Earth Systems Analysis: Geodynamics
- GEOL 6102 Earth Systems Analysis: Paleoenvironments
- GEOL 6103 Earth Systems Analysis: Solid Earth Geochemistry
- GEOL 6651 Workshops in Geology
- GEOL 6800 Individual Study in Geology

**Research Credit Options**
- GEOL 6110 Directed Research in the Solid Earth Science
- GEOL 6120 Directed Internship in the Solid Earth Sciences
- GEOL 6130 Thesis Research in the Solid Earth Sciences

**Climatology and Hydrology**

**Overview**

This concentration prepares students for careers in both the private and public sectors concerned with the study, management and regulation of water and air resources. Examples of such careers include water quality modeling, water supply analysis, forest hydrology, watersheds management, storm water studies, stream restoration, erosion control, underground storage tank permitting and groundwater remediation, environmental regulation and planning, and weather prediction. This concentration is also of interest to secondary school Earth Sciences educators who wish to pursue advanced studies in atmospheric and hydrological sciences. The program will
also prepare students who wish to pursue additional graduate study at the Ph.D. level in hydrological and/or atmospheric sciences and biogeochemistry.

Course Work
The following courses are available in the concentration in Climatology and Hydrology:

ESCI 5140 Hydrologic Processes
ESCI 5150 Applied Climatology
ESCI 5155 Fluvial Processes
ESCI 5170 Fundamentals of Remote Sensing
ESCI 5180 Digital Image Processing in Remote Sensing
ESCI 5222 Watershed Science
ESCI 6060 Earth Sciences Field Investigations
ESCI 6201 Earth Systems Analysis: Climate
ESCI 6202 Earth Systems Analysis: Biogeochemical Cycles
GEOL 5105 Geomorphology
GEOL 5145 Fundamentals of Hydrogeology
GEOL 5165 Aqueous Geochemistry

Research Credit Options
ESCI 6210 Directed Research in Climatology and Hydrology
ESCI 6220 Directed Internship in Climatology and Hydrology
ESCI 6230 Thesis Research in Climatology and Hydrology

Environmental Systems Analysis
Overview

This concentration prepares students for employment in the environmental consulting industry, government agencies charged with assessing and monitoring land use, water and air quality, and storm water monitoring. The concentration also prepares those students interested in further graduate work or a career as an earth sciences teacher.

Course Work
The following courses are suggested for the concentration in Environmental Systems Analysis:

ESCI 5140 Hydrologic Processes
ESCI 5155 Fluvial Processes
ESCI 5170 Fundamentals of Remote Sensing
ESCI 5180 Digital Image Processing in Remote Sensing
ESCI 5222 Watershed Science
ESCI 5233 Geoenvironmental Site Characterization
ESCI 6060 Earth Sciences Field Investigations
ESCI 6301 Earth Systems Analysis: Human-Interactions
ESCI 6302 Earth Systems Analysis: Statistical and Risk-based Decision Support Systems
GEOL 5105 Geomorphology
GEOL 5115 Applied Geophysics
GEOL 5120 Geologic Mapping and Interpretation
GEOL 5135 Tectonics
GEOL 5145 Fundamentals of Hydrogeology
GEOL 5175 Geochemistry
GEOG 5120 Geographic Information Systems
GEOG 5130 Advanced Geographic Information Systems
GEOG 5165 Environmental Planning
GEOG 6615 Advanced Seminar in Spatial Decision Support Systems

Research Credit Options
ESCI 6310 Directed Research in Environmental Monitoring and Decision Support Systems
ESCI 6320 Directed Internship in Environmental Monitoring and Decision Support Systems
ESCI 6330 Thesis Research in Environmental Monitoring and Decision Support Systems

Advising
Upon admission to the program each student is assigned an initial faculty advisor from the student's declared area of interest. This advisor guides the student through the design and implementation of a program of study tailored to the student's specific needs and career goals. The advisor generally is available to the student for advice on academic and other problems. Students must confer with their advisors regularly concerning academic matters.

Once the student has become familiar with the program and the faculty, it is possible to change advisors by obtaining prior approval from the faculty member with whom the student wishes to work. Advisors are chosen to match, as nearly as possible, the student's academic and career interests. No student will be allowed to register for classes without the signature of his/her advisor.

All students are required to formulate a complete plan for their M.S. by the end of their first semester. This plan will include the names of the student's thesis or internship committee members, or the names of faculty sponsoring the directed studies. This ad hoc committee is hereafter referred to as the research committee. This plan must be approved by their advisor and the Graduate Committee, and serves as a guide to their course of study while at UNC Charlotte.

Transfer Credit
As many as six semester hours of course work may be accepted for transfer from other accredited institutions upon approval of the student's advisor, the departmental
Graduate Committee, and the Dean of the College of Arts and Sciences.

Comprehensive Examination
To complete the program, each student must pass a two-part comprehensive examination covering 1) general aspects of the discipline, and 2) a defense of their adopted research project. It is the responsibility of the advisor in consultation with the student to arrange each of the exams. In every instance, before either part of the exam can be administered, every member of the graduate faculty of the Department must receive written notification.

The Written Exam
Part I of the comprehensive exam is a written exam in which the student must respond to questions submitted by the faculty. These questions will examine knowledge from at least two of the program concentrations. The questions are solicited from the entire graduate faculty of the Department by a memo sent by the student's advisor who then administers the examination. The written comprehensive exam is normally taken during the third semester (for full-time students) and in no case should the student take this exam before accumulating 27 hours of course work including courses in progress. This exam may not be administered if the student has outstanding incomplete grades in any course work.

The Defense of the Research Project
Part II of the comprehensive exam is the defense of the research project (either thesis, internship, or one directed research project). This exam is generally administered at the discretion of the advisor and the student. When the advisor is satisfied that the student’s research and writing has progressed sufficiently the research document is provided to the other members of the research committee. If they agree that the document is ready for a defense, an exam is scheduled. The advisor must then notify, in writing, every member of the Department's graduate faculty of the date, time, place and the topic (title with abstract) of the defense.

Committees
All final research projects are evaluated by a faculty committee known as the research committee. Research committees must have a minimum of three members composed of the graduate faculty of the Department or associated departments. Additional members are acceptable and in many cases outside members, other departments, or internship coordinators from off-campus agencies are advisable.

Thesis/Internship/Directed Projects
A common research experience is not appropriate for all students. Instead, students can pursue research experiences that are appropriate to departmental faculty resources, individual student’s programs, and the availability of opportunities that exist to work with allied agencies or clients on or off campus. One of three options will be available: 1) a nine credit hour research experience similar to that of a traditional academic thesis; 2) a nine credit hour research experience which involves either a paid or unpaid internship arranged with a public or private agency or client; and 3) two or three research experiences of 3 to 6 credit hours each. The research experiences will be supervised by individual faculty members and will total 9 credit hours. Each of these options fulfills program requirements equally.

Students must complete nine hours of applied research. They may select either of the three options below:
1) Directed Research (3-6): GEOL 6110 Solid Earth Sciences; or ESCI 6210 Climatology and Hydrology; or GEOL 6310 Environmental Monitoring and Decision Support Systems
2) Directed Internship (9 hours): GEOL 6120 Solid Earth Sciences; or ESCI 6220 Climatology and Hydrology; or GEOL 6320 Environmental Monitoring and Decision Support Systems
3) Thesis Research (9 hours): GEOL 6130 Solid Earth Sciences; or ESCI 6230 Climatology and Hydrology; or GEOL 6330 Environmental Monitoring and Decision Support Systems

Not every student can expect to engage in a paid internship because the number of students frequently exceeds a matching number of opportunities funded in that manner. Unpaid internships provide the same caliber of experience and training in an applied environment. In some cases, that experience may link students with non-profit agencies or social services that simply do not have the resources to fund an internship. In either case, the topic of the internship is defined by the client’s problem or needs.

Not every student can expect to develop the thesis option, but it does provide a choice for the student to pursue a research problem in a direction of his/her individual interest. Students who ultimately plan to pursue a Ph.D. degree might be more inclined and encouraged toward that option. The same is true of students who wish to complete their master’s program with that kind of individual research activity. In all cases, students must work closely with their advisor and program committee to choose the option which best fits both their particular program and prevailing circumstances.

COURSES IN EARTH SCIENCES AND GEOLOGY

Earth Sciences
ESCI 5000. Selected Topics in Earth Sciences. (1-4)
Prerequisites: ESCI 1101, GEOL 1200-1200L, or permission of the instructor. In-depth treatment of specific topics selected from one of the fields of the earth sciences. May be repeated for credit as topics vary. (On demand)
ESCI 5140. Hydrologic Processes. (4) Prerequisite: ESCI 1101 or GEOL 1200-1200L. Atmospheric, soils and geologic aspects of surface and ground water processes. Three lecture hours and one three-hour lab per week. (Fall)

ESCI 5150. Applied Climatology. (3) Prerequisite: ESCI 3250 or consent of instructor. Methods of acquiring and analyzing climatic data in various types of applied problems. Emphasis on methods to assess and reduce the impact of weather and climate upon human activities. (Spring)

ESCI 5155. Fluvial Processes. (4) Hydrologic and geomorphic study of the transport of water and earth materials within stream systems. Erosion, mass wasting, open channel flow, sediment transport, flooding, stream channel morphology, morphometry of drainage basins, and related topics. Three lecture hours, three lab hours per week. (Spring)

ESCI 5170. Fundamentals of Remote Sensing. (4) Prerequisite: ESCI 1101 and GEOL 1200, or consent of the instructor. Physical fundamentals of remote sensing and overview of airborne and satellite systems operating in the visible, infrared, and radar regions, and a review of applications for resource exploration, environmental studies, land use and land cover analysis, and natural hazards. One 2-1/2 hour lecture, and one three-hour lab per week. (Spring)

ESCI 5180. Digital Image Processing in Remote Sensing. (4) Prerequisite: ESCI 5170 or consent of instructor. Scientific and computational foundations of digital image processing techniques for extracting earth resource information from remotely sensed data. Three lecture hours and three lab hours per week. (Spring)

ESCI 5222. Watershed Science. (3) Prerequisites: M.A. Geography students: ESCI 5140 or 5155 or GEOL 5145. Examination of the cycling of water and chemical elements in natural and perturbed watersheds with emphasis on linkages between the hydrologic and biogeochemical processes which control runoff water quality. Topics include runoff processes, evapotranspiration, nutrient export and stream, riparian and hyporheic zone hydrochemical dynamics. (Spring)

ESCI 5233. Geoenvironmental Site Characterization. (4) Prerequisites: Earth Sciences, Geology and M.A. Geography majors: ESCI 4140 or 4155. Others require consent of the instructor. Advanced field-based examination of hydrologic and geologic conditions in the southeastern United States within the context of current state and federal regulatory requirements and site characterization activities currently performed by professional environmental geoscientists. Hydrologic investigation and water quality characterization, and geological and geophysical site investigations. (Summer)

ESCI 5400. Internship in Earth Sciences. (3-6) Prerequisite: consent of the Graduate Committee. Research and/or work experience designed to be a logical extension of a student's academic program. The student must apply to Graduate Advisory Committee for an internship by submitting a proposal which specifies the type of work/research experience preferred and how the internship will complement his or her academic program. The Graduate Committee will attempt to place the selected students in cooperating community organizations to complete specified research or work-related tasks which are based on a contractual arrangement between the student and community organization. The student can receive three to six hours credit, depending on the nature and extent of the internship assignment. (On demand)

ESCI 6060. Earth Sciences Field Investigations. (1-6) Prerequisite: consent of instructor. A concentrated field investigation of selected earth sciences topics. Course subject matter, credit hours, location and duration will be specified each time course is offered. May be repeated for credit. Pass/No Credit grading. (On demand)

ESCI 6201. Earth Systems Analysis: Climate. (3) Current working hypotheses and research methods are reviewed for the study of climatology and climate change. Theories and mechanisms of climate change, as well as the interrelationships between the components of the climate system, are discussed towards understanding and explaining past, present and possible future climatic behavior. (On demand)

ESCI 6202. Earth Systems Analysis: Biogeochemical cycles. (3) This course examines the Earth’s water and major elemental cycles including those of carbon, nitrogen, sulfur, phosphorus and the major crustal elements. Uncertainties in the current state of understanding of global elemental cycles are examined. Special emphasis is placed on how these cycles are currently being modified through human activities. (On demand)

ESCI 6210. Directed Research in Climatology and Hydrology. (3-6) A one or two semester research project, performed under the direction of a member of the faculty within Climatology and Hydrology. The project must be hypothesis-driven, and include formulation, implementation, analysis and presentation research components. (On demand)

ESCI 6220. Directed Internship in Climatology and Hydrology. (9) Prerequisite: Consent of the Graduate Committee. Community/industry sponsored research/work experience in hydrological and/or climatological sciences with a well-defined applied research focus. While each internship may vary in its content, the student must submit and have approved a well-defined statement of research which details how the internship will complement his or her academic program. Each proposal must identify both a community/industry
research supervisor, and a faculty internship advisor. A final report detailing the research experience and results is required. *(On demand)*

**ESCI 6230. Thesis Research in Climatology and Hydrology. (9)* Prerequisite: Consent of the Graduate Committee. The student will conduct hypothesis-driven research involving contemporary issues in Climatology and/or the Hydrological Sciences. This option is most commonly chosen when a student works under an assistantship in association with a funded faculty research project. The student will prepare and defend a traditional thesis upon completion of their research. A thesis proposal must be approved by the student’s examination committee prior to registration for thesis credit.* (On demand)

**ESCI 6301. Earth Systems Analysis: Human Interactions. (3)* Current working hypotheses and research methods are reviewed for the regional and global scale coupling of categorical human activities and earth processes. The focus is on GIS-based modeling frameworks for parametric impact assessment. *(On demand)*

**ESCI 6302. Earth Systems Analysis: Statistical and Risk-based Decision Support Systems. (3)* Statistical and risk-based research/decision support methods are reviewed for local and regional environmental assessment and management. The focus is on parametric statistical analysis of large temporal and spatial datasets for the human-interface with the local and regional air, water and land resources. Valuation, ranking, prioritization, and indexing models for environmental management are also discussed. *(On demand)*

**ESCI 6310. Directed Research in Environmental Monitoring and Decision Support Systems. (3-6)* A one or two semester research project, performed under the direction of a member of the faculty within the environmental monitoring and decision support systems area. The project must be hypothesis-driven, and include formulation, implementation, analysis and presentation research components. *(On demand)*

**ESCI 6320. Directed Internship in Environmental Monitoring and Decision Support Systems. (9)* Prerequisite: Consent of the Graduate Committee. Community/industry sponsored internship in the area of environmental monitoring and decision support systems with a well-defined research focus. While considerable flexibility exists in the research problem design, each internship must have a well-defined statement of the research problem wherein the independent research to be performed by the intern is clearly stated. In addition both a community/industry research supervisor, and a faculty internship advisor must be identified prior to registration. *(On demand)*

**ESCI 6330. Thesis Research in Environmental Monitoring and Decision Support Systems. (9)* Prerequisite: Consent of the Graduate Advisory Committee. Traditional hypothesis-driven research thesis focused on contemporary issues in the area of environmental monitoring and decision support systems. This option is most commonly chosen when a graduate student works under a research assistantship in association with a funded faculty research project. A thesis proposal must be approved by a faculty member in the Environmental Monitoring and Decision Support Systems area prior to registration for thesis credit. *(On demand)*

**ESCI 6650. Workshop in Geography. (4)* A series of lectures on the subject matter of the atmosphere and hydrosphere with accompanying laboratory sessions. *(On demand)*

**ESCI 6800. Individual Study in Earth Sciences. (1-4)* Prerequisite: permission of the instructor and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. *(On demand)*

**Geology**

**GEOL 5000. Topics in Geology. (1-4)* Prerequisites: ESCI 1101, GEOL 1200-1200L, or permission of the instructor. In-depth treatment of specific topics selected from one of the fields of geology. May be repeated for credit as topics vary. *(On demand)*

**GEOL 5100. Igneous and Metamorphic Petrology. (4)* Prerequisite: GEOL 3115. Classification, mineralogy and chemical properties of igneous and metamorphic rocks including the tectonic processes by which they formed. Lab emphasizes hand specimen and petrographic description and interpretation of rocks in thin sections. *(Alternate years)*

**GEOL 5105. Geomorphology. (3)* Prerequisite: ESCI 1101; GEOL 1200 and 1200L. Surficial processes and landform development as controlled by climate, tectonics, rock characteristics and time with emphasis on plate tectonic, weathering, erosion, mass wasting, surface water, groundwater, glacial, wind coastal processes and climate change in landscape development. *(Fall)* *(On demand)*

**GEOL 5105L. Geomorphology Laboratory. (1)* Prerequisite or co-requisite: GEOL 5105. Analysis of landforms and the surficial processes responsible for landform development. One lab period of 3 hours per week. *(Fall)* *(On demand)*

**GEOL 5110. Stratigraphy. (4)* Prerequisites: GEOL 1210 and 3124. Vertical and horizontal relationships of layered earth materials as a key to understanding basin history, past depositional environments and their transformation through time. Three lecture hours, three lab hours per week. *(Spring)*
GEOL 5115. Applied Geophysics (4) Prerequisites: GEOL 3115, 3130 and introductory physics or consent of instructor. Instrumental analysis of the earth's physical parameters. Study of human-induced seismic and electrical signals, and natural magnetic and gravitational fields for the purposes of locating faults, ore bodies, ground water and other earth hazards or resources. Three hours of lecture and one two-hour lab per week. (On demand)

GEOL 5120. Geologic Mapping and Interpretation. (4) Prerequisites: GEOL 3130 and 5100 or consent of instructor. Field and lab oriented study using principles of mineralogy, petrology and structural geology. Involves collection and resolution of field data, techniques of presenting data, development of geologic maps, and critical reviews of existing literature. Two hours of lecture, four hours of lab/field work per week. (Alternate years)

GEOL 5125. Geologic Summer Field Camp. (6) Prerequisite: Consent of instructor. Concentrated field investigation of geologic features. Data collection in the field, geologic mapping, report and map preparation and time management. Location of field camp will be specified each time course is offered. (Summer)

GEOL 5130. Optical Mineralogy. (4) Prerequisite: GEOL 3115. Light optics theory, the behavior of plane polarized light in a solid medium. The laboratory emphasizes the use of petrographic microscope oil immersion techniques and identification of the common rock forming minerals. Three hours of lecture and one three-hour lab per week. (Spring)

GEOL 5135. Tectonics. (4) Prerequisite: GEOL 3130 or consent of the instructor. A systematic examination of the evolution and dynamics of the earth from the perspective of plate tectonics theory. Three lecture hours, one three-hour lab per week. (Alternate years)

GEOL 5145. Fundamentals of Hydrogeology. (3) Prerequisites: GEOL 1200, CHEM 1252 or consent of instructor. Physical and chemical principles of ground water including the framework of ground water within the geologic and hydrologic cycles, its exploitation and protection as a natural resource, and its importance as a resource in the southeastern United States. (On demand) (Evenings)

GEOL 5145L Hydrogeology Laboratory. (1) Prerequisites: GEOL 1200, CHEM 1252, MATH 1242, PHYS 1101 and GEOL 5145 (or corequisite) or consent of instructor. Ground water investigation and analysis. Topics include storage of water in rocks, movement and chemical evolution of ground water, and assessment of regional ground water conditions. One three-hour lab per week. (On demand) (Evenings)

GEOL 5150. Directed Research in the Solid Earth Sciences. (3-6) A one or two semester research project, performed under the direction of a member of the faculty
within the Solid Earth Sciences. The project must be hypothesis-driven, and include formulation, implementation, analysis and presentation research components. (On demand)

**GEOL 6120. Directed Internship in the Solid Earth Sciences.** (9) Prerequisite: Consent of Graduate Committee. Community/industry sponsored research/work experience in the Solid Earth Sciences with a well-defined applied research focus. While considerable flexibility exists in the research problem design, the student must submit and have approved a well-defined statement of the research and how this will complement his or her academic program. In addition, the proposal must identify both a community/industry research supervisor, and a faculty internship advisor. (On demand)

**GEOL 6130. Thesis Research in the Solid Earth Sciences.** (9) Prerequisite: Consent of the Graduate Committee. Hypothesis driven research on contemporary issues in the Solid Earth Sciences. This option is most commonly chosen when a student works under an assistantship in association with a funded faculty research project. The student will prepare and defend a traditional thesis. A thesis proposal must be approved by the Graduate Committee prior to registration for thesis credit. (On demand)

**GEOL 6651. Workshops in Geology.** (4) A series of lectures on subject matter of the lithosphere and space science with accompanying laboratory sessions. (On demand)

**GEOL 6800. Individual Study in Geology.** (1-4) Prerequisite: Permission of the instructor and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. (On demand)

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**ENGLISH**

Department of English  
275 Fretwell  
704-687-2296  
http://www.uncc.edu/engldept/

**Degree**  
M. A., Certificates

**Coordinator**  
Dr. Boyd Davis

**Graduate Faculty**  
Christiane Bongartz, Assistant Professor  
Deborah Bosley, Associate Professor  
Lil Brannon, Professor  
Paula Connolly, Associate Professor  
Boyd Davis, Professor  
Christopher Davis, Associate Professor  
Susan Gardner, Associate Professor  
Leon Gatlin, Associate Professor  
Sandra Govan, Professor  
Robert Grey, Associate Professor  
Tony Jackson, Associate Professor  
Jay Jacoby, Professor  
Cy Knoblauch, Chair, and Professor, Department of English  
Jeffrey Leak, Assistant Professor  
Ronald F. Lunsford, Professor  
James Holt McGavran, Professor  
James McVey, Assistant Professor  
Margaret Morgan, Associate Professor  
Anita Moss, Professor  
Malin Pereira, Associate Professor  
Esther Richey, Associate Professor  
Blair Rudes, Assistant Professor  
Anthony Scott, Assistant Professor  
Daniel Shealy, Professor  
Ralf Thiede, Associate Professor  
Sam Watson, Professor  
Mark I. West, Professor  
Greg Wickliff, Associate Professor

**MASTER OF ARTS**

**Program of Study**  
The master's program in English is designed to accommodate a wide variety of students: those seeking personal enrichment through increased knowledge and understanding; those preparing to pursue a Ph.D. in English or other advanced professional degrees; and those seeking professional advancement in such fields as writing, publishing, or teaching on the primary, secondary, or college levels. The Department offers a broad range of courses in literature, writing/rhetoric, and language, including second language studies and applied linguistics. The Department also offers concentrations in children's literature and technical/professional writing.

**Additional Admission Requirements**  
In addition to the general requirements for admission to the Graduate School, the following are required for study in English:

1) Thirty hours of undergraduate coursework in English beyond the freshman level, or evidence of equivalent academic preparation for graduate study in English, as approved by the Department.

2) A satisfactory score on the Aptitude portion of the Graduate Record Examination or on the Miller Analogies Test.
Degree Requirements
The program requires a minimum of 36 semester hours of graduate credit with grades of A or B. (A course in which a graduate student receives a grade of C is not allowable as part of the 36 required hours.) At least 18 semester hours must be in English courses at the 6000-level, open only to graduate students. A student must choose one of these emphases: literature, writing/rhetoric, technical & professional writing or applied linguistics, or a concentration in children's literature and technical/professional writing. Courses beyond 36 hours of graduate credit may be required to remove deficiencies or to satisfy requirements for graduate licensure, or may be recommended to develop areas of need, to pursue particular interests, or to gain specific experience.

Of the 36 hours of graduate credit, 30 must be in English courses; the remaining 6 hours may be taken in English or in another discipline. If the hours are to be taken outside of English, the student must submit a written request to the Coordinator of Graduate Studies, explaining how these hours will enrich his/her program.

No more than 6 hours of ENGL 6890 (Directed Reading), may be applied to the degree without written permission of the Chair of the Department.

Assistantships
A number of graduate assistantships are available each year. Applications must be submitted by March 15 for assistantships beginning the following academic year. Further information is available in the Department.

Internships
ENGL 5410. The Department of English offers a number of internships for graduate students (limited to 3 hours of credit), which provide program-related experience in local television and radio stations, non-profit and government agencies, and local businesses and corporations. Further information is available in the Department.

Advising
The graduate coordinator and other graduate faculty member acting as his/her designated assistant will advise graduate students.

Licensure
Students seeking licensure in English should refer to the requirements of the M.A. in English Education program.

Comprehensive Examination
Students must satisfactorily complete a written examination based on a reading list keyed to their chosen emphasis. These lists are available in the Department office. The written examination may not be attempted sooner than the last semester of coursework, exclusive of thesis credits. The reading lists were revised for students entering the program in Spring 2002 and thereafter.

Thesis
The M.A. thesis is optional; it may be either scholarly or creative. See course description for ENGL 6996.

Tuition Waivers
Each year, one one-of-state tuition waiver is available for a new graduate assistant. In-state tuition waiver funds are also available for new graduate assistants and sometimes for other outstanding applicants.

Core Courses
All M.A. candidates, regardless of which concentration or emphasis is chosen, are required to take ENGL 6101 (Introduction to English Studies) and ENGL 6160 (Introduction to the English Language).

Emphasis Descriptions
The Literature Emphasis
The literature emphasis includes five literature courses, at least three of which are historically oriented. Two of these courses must be in one national literature and the third in a different national literature. In addition, one writing/rhetoric course, one literary theory-intensive course, and three electives are required.

The Writing Emphasis
The writing emphasis includes four writing/rhetoric courses, one writing/rhetoric theory-intensive course, two literature courses, and three electives. The writing emphasis may focus on creative writing, technical/professional writing, or writing and pedagogy.

The Applied Linguistics Emphasis
The Applied Linguistics emphasis includes two writing/rhetoric courses, two literature courses, and four courses selected from the following:

ENGL 5161 Modern Grammar
ENGL 5165 Language and Culture
ENGL 5166 Comparative Language Studies for Teachers
ENGL 5260 History of the English Language or:
ENGL 6162 History of the English Language
ENGL 5263 Linguistics and Language Learning
ENGL 6163 Language Acquisition
ENGL 6161 Introduction to Linguistics
ENGL 6070 Topics in English (Approval of Graduate Coordinator required)

In addition, students will choose one course from the following:

ENGL 5050 Topics in English (linguistics topics only)
ENGL 5254 Teaching English/Communications Skills to Middle and Secondary School Learners
ENGL 5400 English Composition Practicum
ENGL 5264  Literacy in Community/Family
ENGL 6195  Teaching College English

The Technical/Professional Writing Concentration
Students accepted into the MA in English program may elect a writing track with a concentration in Technical/Professional Writing. The curriculum includes 1) working for real clients; 2) learning Internet and Webpage design; 3) building project management and teamwork skills; and 4) learning applications such as Adobe PageMaker, Powerpoint, authoring tools, and word-processing systems.

Students will learn new computing applications, how to work as members of development teams how to design and manage complex publication projects, both online and print, and how to assemble professional portfolios.
ENGL 6116  Technical/Professional Writing (this class should be taken in the first year)
ENGL 5180  Theories of Technical Communication
ENGL 5410  Professional Internship
ENGL 6008  Topics in Technical Communication (may be repeated for credit)
ENGL 6166  Rhetorical Theory
15 hours selected from: 5181, 5182, 5183, 5204, 5205, 5008 (may be repeated for credit), 5852, 6062 (maybe repeated for credit), 6890, 6996, up to 6 hours of Creative Writing, Literature, or Linguistics courses

The Children's Literature Concentration
This concentration is premised on the assumptions that children's literature is an integral part of many literary traditions and that students studying children's literature should develop an understanding of the connection between children's literature and other forms of literature.
Students will take:
6 hours in literature (not Children's Literature)
6 hours in writing/rhetoric
ENGL 6103  Juvenile Literature
12 hours selected from: 5102, 5103, 5104, 6104, 6890, 6996, 6070 (Children's Literature Writers), 5050 (topics that relate to Children's Literature), READ 6100, EDUC 5000 (Children's Literature across the Curriculum)
3 hours of an English elective

CERTIFICATES

Graduate Certificate In Applied Linguistics
The Graduate Certificate Program in Applied linguistics enables professionals to focus and solidify or update their work with language teaching and research applications. As technology-supported applications of language theory increase, and as teaching and research opportunities change in response to demographic and educational demands, both in the U.S. and in the global community, this Certificate grounds the participants in both current theory and practice and makes courses in the Applied Linguistics Concentration available to persons with related degrees and professional aspirations.

Admission Requirements
Students are admitted to the Graduate School in a special category for certificate programs. See general information on admission to graduate certificate programs elsewhere in this Catalog.

Certificate Requirements
The Graduate Certificate in Applied linguistics requires 12 hours in approved courses, including at least 6 hours at the 6000-level. A typical program might include 4 of the following courses: ENGL 5161 (Modern English Grammar), ENGL 5165 (Language and Culture), ENGL 6161 (Introduction to Linguistics), ENGL 6163 (Language Acquisition), ENGL 6195 (Teaching College English). Students must earn a grade of “B” or better in all courses presented for the certificate, and must complete the program within four years from the time of first enrollment in a certificate course.

Substitutions from the broader linguistics emphasis and graduate program will be allowed with approval of the Certificate Coordinator, who will act as adviser for those enrolled in the Certificate program.

Students whose dominant language is not English will elect coursework in Second Language Writing: Theory and Applications.

Transfer credits are not accepted in the Certificate program. Students seeking licensure for the teaching of English at levels K-12 should consult the College of Education.

Graduate Certificate In Technical/Professional Writing
The University of North Carolina at Charlotte offers a Graduate Certificate Program in Technical/Professional Writing designed for post-baccalaureate, graduate, and post-graduate students. Students can complete the required 21 graduate credit hours in approximately two years. Students will learn to design information, use hypermedia tools, create on-line support systems, design visuals, develop web pages, manage publications and projects, work with clients, develop portfolios, and learn page layout, graphics, and other software applications.

Admission Requirements
Students must apply for admission to the graduate school and must have a minimum undergraduate GPA of 2.75. Applicants will be required to submit: 1) a current GRE score; 2) a current MAT score; or 3) a portfolio of professional documents. Only graduate courses taken at
UNC Charlotte will count towards this Graduate Certificate.

Certificate Requirements (9 hours):
- ENGL 6166 Rhetorical Theory
- ENGL 6008 Topics in Advanced Technical Communication
- ENGL 5410 Professional Internship

Electives (12 hours)
- ENGL 5180 Theories of Technical Communication
- ENGL 5181 Writing User Documents
- ENGL 5182 Writing & Designing Computer-based Documents
- ENGL 5183 Editing Technical Documents
- ENGL 5008 Topics in Technical Communication

Other Courses: as appropriate and approved by the Department

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ENGLISH EDUCATION

Department of English
(see previous listing under English)

Department of Middle, Secondary, and K-12 Education
5029 Colvard Building
704-547-3220

Degree
M.A.

Coordinator
Dr. Lil Brannon

Program of Study
Designed for experienced middle and secondary English teachers, the M.A. in English Education qualifies graduates for the new Masters/Advanced Competencies “M” license in English Education. The program includes core courses team-taught by faculty in the English Department and the College of Education which focus on issues in the teaching of English and on research methods and advanced study in English and professional education, including a core course in teacher leadership.

Aligned with the 1997 North Carolina Excellent Schools Act and the proposition of the National Board for Professional Teaching Standards, the program prepares graduates to become master teachers who are (1) self-directed in their personal and professional growth as educators, (2) responsive to children’s differences influenced by development, exceptionalities, and diversity, (3) well-grounded in the content and pedagogy of English/Language Arts curriculum, (4) self-reflective, self-evaluative, educational researchers, and (5) collaborative leaders.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, applicants must:
1) Hold the “A” license in Secondary English or Middle Grades Language Arts from the North Carolina Department of Public Instruction (or its equivalent from another state),
2) have at least two years experience of full-time teaching in the secondary or middle grades classroom,
3) an undergraduate GPA of 2.75 overall and 3.0 in the junior/senior years and thirty hours of undergraduate course work in English beyond the freshman level, or evidence of equivalent academic preparation,
4) a satisfactory essay that provides a statement of purpose for Master’s degree study,
5) a personal interview, and
6) a teaching portfolio.

Degree Requirements
The M.A. in English Education Program requires completion of at least 38 semester hours of graduate credit with grades of A or B in approved courses including:

Core Course Requirements (14 hours)
- ENGL/EDUC 6274 Contexts and Issues in the Teaching of English (4)
- ENGL/EDUC 6974 Thesis/Project in the Teaching of English (6)

Professional Requirements (12 Hours)
- MDSK 6260 Principles of Teacher Leadership (3)

Also, 9 additional hours of graduate-level Education courses selected in consultation with the Program Coordinator. The program’s 9 hours of professional courses are not free electives, but a planned program of study identified upon the students’ enrollment in the program as part of the students’ overall professional and program plan.

Content Specialization Requirements (12 Hours)
12 hours of graduate-level English courses selected in consultation with the Program Coordinator. The program’s 9 hours of content specialization courses are not free electives, but a planned program of study identified upon the students’ enrollment in the program as part of the students’ overall professional and program plan.

At least 18 hours of course work in the program must be in English or Education courses at the 5000 level or higher.
Assistantships
Assistants are awarded on a competitive basis through the Department of English and the Department of Middle Grades, Secondary, and K-12 Education

Capstone Experience
Students are required to complete a Master’s Thesis/Project, a formal piece of scholarship, that investigates a particular problem in English education and attempts to provide either data-based practical solutions to the problem or a philosophical/theoretical exploration of the problem and its implications for the classroom. Following the approval from the students’ thesis committee, the candidate must present the findings in a professional manner at a level expected of a master teacher. At this presentation, the students will also present their program portfolio which documents their growth in the program.

Licensure
The M.A. in English Education qualifies graduates for the Masters/Advanced Competencies “M” license in English Education.

COURSES IN ENGLISH

ENGL 5002. Women and Literature. (3) Selected topics focusing on women and literature, such as images of women, women as writers, and women as literary critics. With permission of the English Department, may be repeated for credit as topics vary. (However, only six hours may be used for the requirements for the English major.) (Yearly)

ENGL 5008. Topics in Advanced Technical Communication. (3) Prerequisites: ENGL 2116 and COMM 1101. Exploration, both theoretically and practically, of the interrelation of written, oral and graphic communication within technical rhetorical contexts. May be repeated once for additional credit with the approval of the English Department. (On demand)

ENGL 5050. Topics in English. (3) Special topics not included in other courses. May be repeated for additional credit with approval of the English Department. (On demand)

ENGL 5090. Major Authors. (3) The works, ideas and life of one to three significant authors. With permission of the English Department, may be repeated once for credit as long as different authors are considered. (On demand)

ENGL 5102. Classics in British Children’s Literature. (3) Focuses on pivotal works in the history of British and British Colonial Children’s Literature. (Fall)

ENGL 5103. Classics in American Children’s Literature. (3) Focuses on pivotal works in the history of American Children’s Literature. (Spring)

ENGL 5104. Multiculturalism and Children’s Literature. (3) Focuses on works that represent one or more kinds of cultural, ethnic, or social diversity of the United States and other national literatures. (Fall)

ENGL 5114. Milton. (3) A study of the major poems and selections from the minor works of Milton. (On demand)

ENGL 5116. Shakespeare’s Early Plays. (3) A study of 10 representative plays from the comedies, histories and tragedies written 1590-1600. (Yearly)

ENGL 5117. Shakespeare’s Late Plays. (3) A study of 10 representative plays from the period 1600-1611, including the late tragedies and tragi-comedies. (Yearly)

ENGL 5121. The 18th-Century British Novel: Man, Woman, Manners and Morals. (3) The novel as narrative form and as mirror of the individual in society. Emphasis on fiction by Defoe, Richardson, Fielding, Sterne, Austen, with further readings in the novel of manners and the Gothic romance. (On demand)

ENGL 5122. The Victorian Novel. (3) Readings in British fiction during the triumph of the novel in the 19th century, emphasizing major developments in realism, romance, naturalism. (Alternate years)

ENGL 5123. The Modern British Novel. (3) Representative British novels that embody the cultural and literary developments of the 20th century: the impact of two world wars, the influence of important psychological and economic factors of modern life and their relationships to new techniques in art and literature. (Alternate years)

ENGL 5124. Modern Irish Literature. (3) Readings in Irish literature since 1885, with consideration of the mythology, folklore, and social history of Ireland as they are expressed in poetry, drama and fiction. (On demand)

ENGL 5131. British Drama to 1600, Excluding Shakespeare. (3) A survey of the development of British drama to 1600, with representative plays from the Mystery-Miracle Cycles, the Morality Plays, and Tudor drama, including Lyly, Kyd, Marlowe, Peele, Greene, Dekker. (On demand)

ENGL 5132. British Drama from 160-1642, Excluding Shakespeare. (3) A survey of Jacobean and Caroline drama, including plays by Jonson, Beaumont and Fletcher, Webster, Middleton, Shirley, Ford. (On demand)

ENGL 5133. British Drama of Wit and Intrigue, 1660-1780. (3) The famous bawdy comedy of manners
and the heroic drama of the Restoration, followed by the sentimental comedy and satiric burlesque of the 18th century. (On demand)

ENGL 5143. The American Novel of the 19th Century. (3) Major novelists and traditions from the beginnings of the American novel through the rise of realism, including such novelists as Hawthorne, Melville, Twain, Howells, James. (Alternate years)

ENGL 5144. The American Novel of the 20th Century. (3) Major novelists and traditions from the emergence of naturalism to the present, including such novelists as Crane, Dreiser, Hemingway, Faulkner. (Yearly)

ENGL 5145. Literature of the American South. (3) Selected works of Southern writers which reflect literary and cultural concerns from Colonial times to the present, including such authors as Poe, the early humorists, local color writers, Chopin, Faulkner, Warren, O'Connor, Welty. (Yearly)

ENGL 5146. Contemporary Jewish-American Literature. (3) An introduction to the scope and shape of the contemporary Jewish-American literary traditions. Such writers as Bellow, Malamud, Roth, Singer, and Potok will be studied. (On demand)

ENGL 5147. Early Black American Literature. (3) Prerequisite: ENGL 2301. A survey of significant writings by black Americans before the Harlem Renaissance. (Alternate years)

ENGL 5148. Twentieth-Century Black American Literature: Prose. (3) Intensive study of selected black American 20th-century writers of fiction and nonfiction, beginning with the Harlem Renaissance. (Alternate years)

ENGL 5150. Contemporary Poetry. (3) Poetry in English (including translations) since 1940. (On demand)

ENGL 5151. Modern Drama. (3) Representative Continental, British, and American plays, from Shaw to the present. (On demand)

ENGL 5152. Modern European Literature. (3) Selected modern European authors, translated into English, whose works have been of special interest to readers and writers of British and American literature. (On demand)

ENGL 5153. Contemporary Fiction. (3) Selected present-day fiction, with an emphasis upon works from outside the United States and Britain. Works not originally in English will be studies in translation. (Alternate years)

ENGL 5155. Pan-African Literature. (3) Introduction to significant Pan-African literature, emphasizing the oral tradition, selected works of major authors in the Caribbean and Africa, and the relationships of these traditions to American, British and other literary traditions. Works not originally written in English will be studies in translation. (On demand)

ENGL 5156. Gender and African American Literature. (3) Prerequisite: ENGL 2301, 3100 and 3200, or permission of instructor or graduate status. Exploration of the intersection of gender and African American Literature, focusing on either Black women writers or Black male writers, or a combination in dialogue. Cross-listed as AAA S 4106. (On demand)

ENGL 5157. African American Poetry. (3) Prerequisites: ENGL 2301, 3100 and 3200, or permission of instructor or graduate status. Intensive study of African American poetry, focusing on one period or traversing several. Cross-listed as AAAS 4107. (Alternate years)

ENGL 5158. African American Literary Theory and Criticism. (3) Prerequisites: ENGL 2301, 3100 and 3200, or permission of instructor or graduate status. History of an African American approach to literary analysis, including a practicum in modern criticism. Cross-listed as AAAS 4108. (Alternate years)

ENGL 5161. Modern English Grammar. (3) A study of the structure of contemporary English, with an emphasis on descriptive approaches. (Alternate years)

ENGL 5165. Language and Culture. (3) Readings in and discussion and application of the interrelationships between language and culture, including basic introduction to contemporary American dialects and to social contexts of language. (Yearly)

ENGL 5166. Comparative Language Studies for Teachers. (3) Prerequisite: ENGL 3132, or ENGL 6161, or permission of the Department. An introductory course designed to aid the teacher of English as a Second Language in comparing the systems of sound and structure of another language with those systems in English. (Yearly)

ENGL 5180. Theories of Technical Communication. (3) Prerequisite: ENGL 2116. Rhetorical, psychological, and anthropological theories which underscore the interrelations of written and graphic communication within technical, rhetorical contexts. (Fall)

ENGL 5181. Writing User Documents. (3) Prerequisite: ENGL 2116. Researching and analyzing audiences to write publishable instructions. This includes the production, testing, and revision of tutorials, reference manuals and on-line documents for users of computers and other devices. (Spring)

ENGL 5182. Writing and Designing Computer-based Documents. (3) Prerequisite: ENGL 2116.
Theoretical and practical exploration of desktop publishing. Students will write and publish camera-ready documents by rhetorically integrating text and graphics using computer aids. (Fall)

**ENGL 5183. Editing Technical Documents. (3)**
Prerequisite: ENGL 2116. Document editing, including copy editing, proofreading, substantive editing, and project management. (Spring)

**ENGL 5202. Writing Poetry. (3)**
Prerequisite: ENGL 2126, or graduate status, or permission of instructor. Further study of and practice in the writing of poetry within a workshop format. May be repeated once for credit with the consent of the English Department. (Fall, Spring, Evenings)

**ENGL 5203. Writing Fiction. (3)**
Prerequisite: ENGL 2126, or graduate status, or permission of instructor. This course provides further study of and practice in the writing of fiction within a workshop format. May be repeated once for credit with the consent of the English Department. (Fall, Spring, Evenings)

**ENGL 5204. Expository Writing. (3)**
Writing of essays, criticism and various forms of exposition. (Fall, Spring, Evenings)

**ENGL 5205. Advanced Expository Writing. (3)**
Prerequisite: ENGL 5204. May be repeated once for credit with permission of the English Department. (Alternate years)

**ENGL 5208. Poetry Writing Workshop. (3)**
Prerequisite: ENGL 5202. Designed for advanced writers of poetry. Focuses primarily on student work and peer criticism of it. May be repeated once for credit with permission of department. (Yearly)

**ENGL 5209. Fiction Writing Workshops. (3)**
Prerequisite: ENGL 5203. Designed for advanced writers of fiction. Focuses primarily on student work and peer criticism of it. May be repeated once for credit with permission of department. (Yearly)

**ENGL 5210. Greek and Roman Drama in Translation. (3)**
A study of selected plays of Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca with emphasis on dramaturgy and the development of the Greek and Roman theater. (On demand)

**ENGL 5211. Chaucer. (3)**
The poetry of Geoffrey Chaucer, including the Canterbury Tales and Troilus and Criseyde. (Alternate years)

**ENGL 5252. Modern Literary Criticism. (3)**
Theories of the modern schools of criticism. (On demand)

**ENGL 5254. Teaching English/Communications Skills to Middle and Secondary School Learners. (1-3)**
Approaches to the teaching of English, including recent theories and research related to writing and literary study, designed primarily for teaching in grades 6-12. (Yearly)

**ENGL 5260. History of the English Language. (3)**
Origins and development of the English language, both spoken and written, from its earliest forms to contemporary usage. (Alternate years)

**ENGL 5263. Linguistics and Language Learning. (3)**
Readings in, discussions of, and application of linguistically oriented theories of language acquisition, directed toward gaining an understanding of language-learning processes and stages. (Yearly)

**ENGL 5264. Literacy in Family and Community. (3)**
Exploration of literacy issues and outreach in schools, agencies, and work sites. (Alternate years)

**ENGL 5400. English Composition Practicum. (1-3)**
Prerequisite: consent of the instructor. Through supervised tutorial experience and seminars, this course introduces the student to current developments concerning composition and to a variety of methods for teaching English composition. This course is highly recommended for those planning to teach or those currently engaged in teaching. With permission of the English Department may be repeated once for credit. (Fall, Spring)

**ENGL 5410. Professional Internship. (3 or 6)**
Prerequisites: permission of English Internship Coordinator. Restricted to juniors, seniors, graduate students majoring in English or minoring in English or communications who have at least a 2.5 GPA and a course in professional communication (e.g., journalism, technical communication, public relations, public relations lab, or mass media). Students work 8-10 hours (3 hours credit) or 16-20 hours (6 hours credit) per week in a placement arranged by the Internship coordinator. Only three credit hours may be applied to the English major at
ENGL 5852. Independent Study. (1-3) Prerequisite: consent of the Department. Individual investigations and appropriate exposition of the results. (Unless special permission is granted by the Department Chair, no more than six hours may apply toward the English major.) May be repeated for additional credit with approval of the English Department. (Fall, Spring, Summer)

ENGL 6008. Topics in Advanced Technical Communication. (3) Theoretical and practical exploration of advanced topics in technical communication, including projects in which students write and publish documents by rhetorically integrating text, graphics, and other media using computer aids. (Yearly)

ENGL 6062. Topics in Rhetoric. (3) Examination of and/or research concerning selected issues in rhetorical theory or pedagogy. May be repeated for credit with English Department approval. (Fall, Spring)

ENGL 6070. Topics in English. (3) Selected topics of literature and language. May be repeated for credit as topics vary and with English Department approval. (Fall, Spring)

ENGL 6101. Introduction to English Studies. (3) The discipline of English--its nature, its history, and its methods. Emphasis on (1) the interrelations of literature, language, and writing and (2) the diversity of cultural origins and critical perspectives in English studies, with concentration on selected major critical approaches. Intensive writing and practice in methods of research. Required of all M.A. in English students, preferably at or near the beginning of their programs. (Fall, Spring)

ENGL 6102. Literary Theory. (3) Modern literary theory focusing on the theoretical concepts which underpin literary analysis. Emphases may differ from semester to semester; readings will focus on major theoretical statements and on criticism which applies several approaches to particular literary works. Students will be required to apply what they have learned. (Yearly)

ENGL 6103. The Worlds of Juvenile Literature. (3) Covers a range of literature for children and adolescents including both historical and contemporary works. (Yearly)

ENGL 6104. Major Figures in Children's Literature. (3) Focuses on specific authors or illustrators who have made important contributions to the evolution of children’s literature. (Spring)

ENGL 6111. Shakespeare’s Comedies and Histories. (3) Source materials, textual problems and stage conventions in selected comedies and history plays illustrating Shakespeare’s dramaturgy. (Yearly)

ENGL 6112. Shakespeare's Tragedies. (3) Source materials, textual problems and stage conventions of the great tragedies, illustrating Shakespeare’s dramaturgy. (Yearly)

ENGL 6113. Milton. (3) The complete poetry and selections from the prose. (On demand)

ENGL 6123. The Augustan Age, 1660-1785. (3) Close reading of Dryden, Pope, Swift, Johnson, and a consideration of other literary figures and trends, in the light of intellectual and historical currents. (On demand)

ENGL 6125. The Romantic Era, 1785-1832. (3) Development of the Romantic movement, with emphasis on the works of Wordsworth, Coleridge and other major poets. (Alternate years)

ENGL 6126. The Victorian Era, 1832-1900. (3) Emphasis on Tennyson, Robert Browning, Arnold, Carlyle, Ruskin, Newman. (Alternate years)

ENGL 6141. American Romanticism. (3) Major writers of the 1830s, 40s, and 50s, including Hawthorne, Melville, Whitman, Emerson, Thoreau, and the Transcendental Movement. (Alternate years)

ENGL 6142. American Realism and Naturalism. (3) Major writers of the two movements before and after the end of the 19th century, including Twain, Howells, James, Crane, Dreiser, Norris. (Alternate years)

ENGL 6143. American Modernism. (3) Six to eight writers of the period since World War I, both prose and poetry. (Alternate years)

ENGL 6144. Stylistics. (3) Methodologies for analysis of the style of texts, with special emphasis on diction, syntax, prose, rhythm, voice, and metaphor. (On demand)

ENGL 6147. Perspectives in African-American Literature. (3) A survey of African-American literature, emphasizing the major authors, those relevant historical and social factors, and those specific literary movements that have influenced the development of African-American literature. (Alternate years)

ENGL 6160. Introduction to the English Language. (3) History and nature of English, its grammar, syntax, and lexicon. Integrates the study of language-based rhetorical and literary theory, asks students to consider the nature of language in general, its impact on the user, and the development of the systems of English, concentrating on features of major British and American dialects and registers. (Fall, Spring)
ENGL 6161. Introduction to Linguistics. (3)
Introduction to linguistics, its techniques and objectives, descriptive and historical approaches, language families, language and culture. (Yearly)

ENGL 6162. History of the English Language. (3)
Origins and development of spoken and written English, from its earliest forms to contemporary usage, with some attention to dialects and lexicography. (May not also receive credit for ENGL 4260.) (Alternate years)

ENGL 6163. Language Acquisition. (3) Prerequisite: ENGL 6160 or permission of the instructor. Linguistic theories of first and second language acquisition, including processes and stages of language development. (May not also receive credit for ENGL 4263.) (Yearly)

ENGL 6166. Rhetorical Theory. (3) Rhetorical theories, past and present, focusing on ways that these varied frameworks of understanding have informed the generation, understanding, and pedagogy of writing and other modes of discourse. Emphases will vary from semester to semester, readings will concentrate on major selected rhetorical theories and on implications of these theories for the understanding and pedagogy of discourse. (Yearly)

ENGL 6195. Teaching College English. (3)
Examination of major issues in the theory and practice of literature and composition instruction at the college level. (Yearly)

ENGL 6274. Contexts and Issues in the Teaching of English. (4) Prerequisites: Admission to the Program. Examine the key concepts of the discipline. Consider own identities as readers, writers, teachers, researchers, makers of meaning. Emphasis upon critical approaches and pedagogical issues, with special attention to technology in the teaching of language, composition, and literature, as well as cultural contexts for the study of English. (Fall) (Evenings)

ENGL 6495. Internship in College Teaching. (3) Prerequisite: ENGL 6195. Teaching in one section offered by the English Department under the supervision of English faculty. Students will be accepted for internship only near the end of the degree program and upon approval of the department. Students will be assigned to teach selected basic courses, and also will participate in periodic conferences and seminars. It is strongly recommended that students also take ENGL 4400 before ENGL 6195. (Fall, Spring)

ENGL 6674. Applied Research Methods in the Teaching of English. (4) Prerequisites: Completion of ENGL/EDUC 6274 and 12 hours of graduate credit toward this degree. Building on the research basis established in ENGL/EDUC 6274, this course provides the opportunity to apply research methods in classrooms.

ENGL 6680. Seminar in British Literature. (3) (Yearly)

ENGL 6685. Seminar in American Literature. (3) (Yearly)

ENGL 6890. Directed Reading. (1-3) (Fall, Spring, Summer)

ENGL 6974. Thesis/Project in the Teaching of English. (6) Research integrating the fields of English and Education in a theoretical or application-oriented study. If the thesis/project is the outgrowth of previous coursework, considerable additional research and exposition must be done. (Department approval)

ENGL 6996. Thesis. (6) Appropriate research and written exposition of that research, which may or may not be an outgrowth of work done in previous courses. If the thesis is the outgrowth of previous coursework, considerable additional research and exposition must be done beyond that previously undertaken. The proposed thesis work, as well as the final product, will be approved by a committee of three graduate faculty appropriate to the topic, appointed by the graduate coordinator after consultation with the student, on the basis of a written proposal from the student. It is recommended that thesis work not be undertaken until near the end of progress toward the degree. The thesis title is to be shown on the student's final transcript. A Creative thesis option is available for students who have completed appropriate coursework in Creative Writing. (A statement of recommendations and requirements for form and procedures is available in the English Department office.) (Fall, Spring, Summer)

GEOGRAPHY

Department of Geography and Earth Sciences
448 McEniry Building
704-687-2295
http://www.uncc.edu/colleges/arts_and_sciences/geoearth/

Degree
M.A.

Coordinator
Dr. Tyrel G. Moore

Graduate Faculty
Victoria Bowman, Professional Affiliate
Harrison Campbell, Jr., Assistant Professor
Program of Study

The M.A. in Geography at UNC Charlotte emphasizes the application of geographic skills, methods, and theory to problem solving in contemporary society. To this end, students are offered a solid foundation in research methods, problem formulation and solution, quantitative methods, computer applications and Geographic Information Systems (GIS). Faculty and students are active in the community and students are encouraged to complete their programs with either funded or unfunded internships in the private or public sector.

One of the program’s greatest strengths is the close relationship between its students and faculty and amongst the students themselves. Small class sizes, close student and faculty contact and a strong sense of community are considered essential components of the learning and teaching environment at UNC Charlotte.

The applied geography program at UNC Charlotte is recognized as one of the best of its kind in the country. Many of its graduates have gone directly into jobs as professional geographers, research and/or marketing specialists, location analysts, planners, transportation specialists, and private consultants. About 10 percent of the more than 200 graduates of the program have gone on to study in Ph.D. programs.

Additional Admission Requirements

It is the policy of the Department to provide equal opportunities to all students regardless of race, creed, color, sex, or national origin. The Department maintains slightly different requirements than the general requirements for admission to graduate study at UNC Charlotte. The Department requires applicants to demonstrate evidence of suitability for the program. Applicants are evaluated in the five major areas listed below. Each of these areas are weighted equally during the evaluation of applicants.

All applications for admission to the Community Planning track will be reviewed by the Community Planning Track Interdisciplinary Entrance Committee. All other applications for admission will be reviewed by the Geography Graduate Advisory Committee. The Department will admit applicants on a competitive basis as space in the program allows and grant exceptions to the minimum standards already mentioned as deemed in the best interests of the program.

1) Grade Point Average (GPA): In general the Department would prefer an overall GPA above 3.1 (or a 3.1 for the last 2 years) and a GPA of 3.2 in the major. However, averages less than these minimums will not exclude applicants if the other elements of the application are strong.

2) Letters of Recommendation: Three letters of reference are required. Letters from college or university teachers who have worked with and/or taught applicants are preferred. These letters will be evaluated on the basis of how well the applicant is suited in terms of intellect, motivation and temperament to do graduate course work.

3) Personal Essays: Applicants must write a personal essay which directly addresses why they wish to do graduate work in geography, why they wish to participate in the M.A. program at UNC Charlotte and what they wish to do with the degree they would obtain. They should address directly how the program at UNC Charlotte fits their career and/or professional goals and how they would benefit from and contribute to the M.A. in Geography at UNC Charlotte. This essay is very important in determining the applicant’s commitment to graduate education and to a professional career in geography or a related field. Careful consideration of what goes into this essay is time well spent.

4) Scores on the Graduate Record Exam: In general the Department would prefer scores in the range of 1000 or more on the combined Verbal and Quantitative portions of the GRE. Again, scores less than these suggested minimums will not automatically exclude applicants if the remainder of the applicant's file is strong.

5) Transcripts of College Course Work: The transcripts will be evaluated on the basis of types of courses attempted, range of geography, statistical and computer course work attempted. Not only will the applicant be evaluated on the strength of the performance in these areas, but also on the range, depth and suitability of the applicant’s preparation for graduate level course work.

Additional Requirements for International Applicants: Applicants whose native language is not English must demonstrate their proficiency in English by taking the Test of English as a Foreign Language (TOEFL) examination. Overall scores of 575 with scores of 55 on individual sections (listening comprehension; structure and written expression; vocabulary and reading comprehension) are preferred.

Prerequisite Requirements

Minimum Preparation Suggested for Students Entering the Program:
All prospective graduate students must demonstrate competence in undergraduate subject matter in their area of study. While the Department does not require that applicants have a degree in Geography, prospective graduate students should provide evidence that they are prepared to immediately take full advantage of graduate level course work in Geography.

Students applying to the program should, at a minimum, be familiar with the concepts and materials offered in courses such as basic Economic Geography, Introduction to Spatial Analysis, Location Theory, and Introduction to Research Methods or Statistics.

Any student wishing to pursue additional training in Geographic Information Systems (GIS) should have basic cartography preparation and computer file management and data base skills. The relevant courses at UNC Charlotte are Maps and Graphs and Cartographic Lab.

These courses are considered basic for admission to the UNC Charlotte Masters of Arts in Geography Program. Consequently, a student will normally not be considered prepared for graduate study without equivalent course work. Any student passing the above courses with a grade of B or better at UNC Charlotte or the equivalent courses from another university with a grade of at least B will not be judged deficient in these courses and will not be denied entry based solely on a lack of preparation. All judgments in this area are the responsibility of the Graduate Advisory Committee, the Community Planning Interdisciplinary Committee, and the Department Chair.

Degree Requirements
The M.A. in Geography requires a minimum of 36 semester hours of graduate work. Three specific courses (12 semester hours) are required of all students except those pursuing the Community Planning Track. The remaining 24 hours must be completed at the 5000 or 6000 level. Up to 12 hours may be taken in related work which includes all transfer credit, credit by exam, coursework in other departments and courses taken at the 5000 level. At the discretion of the Department, transfer credit totaling up to 6 hours may be accepted from accredited universities. No student may take more than 6 hours in graduate level independent study (GEOG 6800).

Required Courses (for all except the Community Planning Track)
- GEOG 6100 Quantitative Analysis in Geography (3)
- GEOG 6200 Research Design Fundamentals (3)
- GEOG 7900 Individual Research Project (6)

Elective Courses
1) Other 6000-level courses in Geography - a minimum of 12 hours
2) Related work (outside the Department) in courses numbered 5000 and above - maximum of 12 semester hours. (Departmental approval required)

Total: 36 semester hours

Admission to Candidacy Requirements
The Admission to Candidacy form should be filed upon successful completion of a minimum of 18 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which student expects to complete all requisites for the degree. Completed forms should be forwarded to the Graduate School.

Assistantships
Assistantships are much like a part-time job for the student. Since we try to find work settings that fit the student's academic interest, these assistantships can also offer valuable training opportunities and work experience. The nature of the work will depend entirely on the needs of the client and the training and background of the student. UNC Charlotte faculty are seldom involved in directing the student working in an assistantship. The student, in effect, works for the client.

Graduate assistantships are arranged for either one entire semester or for an entire academic year (2 semesters or 9 months). They are normally scheduled for 16 weeks per semester and the student works 20 hours per week. Assistantships are funded at the rate of $4,500-$5,000 per semester. The Department makes every effort to provide funding to every full-time student in the program.

Track Descriptions
Students may elect to study in one or a combination of three concentrations and one track. The concentrations are location analysis, urban-regional analysis, and transportation studies. The University's interdisciplinary Community Planning Track also is housed within the M.A. in Geography.

Location Analysis
Overview
The location analysis concentration offers course work in:
- retail location
- applied population analysis
- facility siting
- office and industrial location
- trade area analysis
- real estate development
- location research
- regional economic development

This concentration prepares students for jobs in location research with retail companies, real estate developers, consulting firms, commercial banks, and economic development agencies or for continued academic training in economic geography and location analysis.

Course Work
The following courses are suggested for a concentration in location analysis:
- GEOG 5108 Sport, Place and Development (3)
- GEOG 5155 Retail Location (3)
- GEOG 5255 Applied Population Analysis (3)
Urban-Regional Analysis
Overview
Students in the urban-regional analysis concentration normally pursue course work in one of the following areas:
- community development
- regional development
- GIS based analysis
- site feasibility
- public facility siting
- impact analysis

Students normally gain employment in public sector community development and planning as well as the private sector.

Graduates of the M.A. in Geography program hold positions in a number of local and regional agencies in North Carolina and South Carolina as well as in other states such as Connecticut, Florida, Georgia, Kentucky, New York, and Washington. They have responsibility for a broad range of development issues and tasks including economic development, geographic information systems, housing, land use, community and neighborhood analysis, open space, recreation, and planning administration. Job placement for graduates has been very successful.

Course Work
Students normally choose courses from the following for a concentration in urban-regional analysis:
- GEOG 5101 Cartographic Techniques (3)
- GEOG 5103 Computer Mapping (3)
- GEOG 5108 Sport, Place and Development (3)
- GEOG 5120 Introduction to Geographic Information Systems (4)
- GEOG 5130 Advanced Geographic Information Systems (4)
- GEOG 5210 Urban Planning Methods (3)
- GEOG 5255 Applied Population Analysis (3)
- GEOG 5260 Transportation Policy Formulation (3)
- GEOG 5265 Transportation Analysis Methods (3)
- GEOG 6005 The Restructuring City (3)
- GEOG 6015 Topics in Regional Geography (3)
- GEOG 6016 Urban Planning: Theory and Practice (3)
- GEOG 6040 Transportation Topics (3)
- GEOG 6100 Quantitative Analysis in Geography (3)
- GEOG 6103 Real Estate Development (3)
- GEOG 6104 Industrial Location (3)
- GEOG 6106 Urban Planning: Theory and Practice (3)
- GEOG 6116 Applied Regional Analysis (3)
- GEOG 6615 Spatial Decision Support Systems (4)

In addition, selected course work offered by the Civil Engineering and Marketing Departments is available for students in this program. Additional course work is available through GEOG 6800, Directed Problems, and a capstone, Individual Research Internship Project, GEOG 7900.

Community Planning
Overview
The Community Planning Track is structured to provide students with grounding in planning skills, methods and theory, and practical experience for careers in community planning. That structure is supported by interdisciplinary perspectives from core coursework in Architecture, Economics, Geography, and Public Administration.

Job Prospects
Although the Track is just in its early years of implementation, graduates have no difficulty in finding jobs. Graduates have been hired by local and regional planning agencies to give the Track an excellent placement success rate. Perhaps a third of the students who pursue the program are practicing planners who wish to build and improve their professional skills.

Curriculum - Required hours 36 semester hours
The track comprises an interdisciplinary curriculum. Core requirements and approved electives are listed below:

Core coursework (21 hours, required of all students)
- GEOG 5210 Urban Planning Methods (3)
- GEOG 6040/ARCH 6050 Community Planning Workshop (3)
- GEOG 6100 Quantitative Analysis in Geography (3)
- GEOG 6106 Urban Planning: Theory and Practice (3)
- ARCH 5214 Dilemmas of Modern City Planning (3)
- ECON 6250 Advanced Urban and Regional Economics (3)
The MA in Geography at UNC Charlotte emphasizes the application of skills, methods and theory to problem solving. Given this focus, the Internship often is a critical, capstone element of many students' programs and normally replaces the traditional thesis as the capstone element of many students' programs and solving. Given this focus, the Internship often is a critical, application of skills, methods and theory to problem solving. The student normally is paid somewhere between $1,200 and $2,000 per month depending on the nature of the job. Internships are somewhat like consulting contracts. An internship project normally involves a student in the execution of a substantive research task for a private or public sector client. While a research project always involves some oversight and direction from UNC Charlotte faculty and the client, the student is the primary investigator and has the major responsibility for a specific "real world" research task or research question. Internships may involve work executed within the client's work setting requiring the intern to report for work at a pre-established schedule or they may be less structured and more task oriented. The type of work setting will depend entirely on the client preference and the nature of the internship problem or task. Internships normally last three to five months. In the Internship, the student can work more than 20 hours per week. The student can be paid directly by the client or the client may contract with the university to pay the student. Normally somewhere between 8-10 students are involved in internships at any given time. Some students opt for more traditional, thesis style capstones to their academic program.

Given the applied thrust of the Department it is our intent to have as many graduate students as possible complete an internship—either funded or unfunded. However, for a variety of reasons it may not always be possible or advisable to arrange an internship. It may be in the best interests of the student, given individual career goals and program interests, to complete a thesis; it may not be possible to locate a sponsor whose needs fit the interests of the student; a student's advisor may recommend against placing a student in an internship; a special situation may not allow a student to be employed.

Advising
Upon admission to the program each student will be assigned a faculty advisor from the student's declared area of interest. This advisor will help guide the student through the design and implementation of program of study tailored to the student's specific needs and career goals. The advisor will generally be available to the student for advice on academic and other problems. Students must confer with their advisors regularly concerning academic matters.

More often than not, students will not work with the same advisor throughout the entire program. Once the student has become familiar with the program and the faculty, it is possible for a student's advisor to help guide the student through the design and implementation of program of study tailored to the student's specific needs and career goals. The advisor will generally be available to the student for advice on academic and other problems. No student will be allowed to register for a class without the signature of their "official" advisor.

All students are required to formulate a complete plan for their M.A. by the end of their first semester. This plan must be approved by their advisor and will serve as a guide to their course of study while at UNC Charlotte.

Transfer Credit
As many as six semester hours of course work may be accepted for transfer from other accredited institutions upon approval of the student's advisor, the departmental Graduate Advisory Committee, and the Dean of the Graduate School. Course credit may also be earned by examination. The specific arrangements for this procedure must be made through the advisor and the course instructor. The total of all transfer credits, credits earned through examination, and related work together may not exceed 12 credit hours.

Elective Coursework (minimum 9 hours) from the following:
- GEOG 5120 Introduction to Geographic Information Systems (4)
- GEOG 5130 Advanced Geographic Information Systems (4)
- GEOG 5255 Applied Population Analysis (3)
- GEOG 5260 Transportation Policy Formulation (3)
- GEOG 5265 Transportation Analysis Methods (3)
- GEOG 5270 Evaluation of Transportation Impacts (3)
- ARCH 6050 The Architecture of Settlements (3)
- ARCH 6050 Public Spaces in Cities (3)
- ARCH 6050 Urban Transit and City Form (3)
- ARCH 7103/7104 Urban Design Problems (Topical Studio) (5)
- MPAD 6102 Legal and Institutional Foundations of Public Administration (3)
- MPAD 6131 Public Budgeting and Finance (3)

Capstone Research Project (6 hours, required of all students)
- GEOG 7900 Individual Research Project (6) (taken in final semester)
Comprehensive Examination
To complete the program, each student must pass a two part comprehensive examination covering both general aspects of the discipline and in defense of the individual research project. It is the responsibility of the advisor in consultation with the student to arrange each of the exams. In every instance, before either part of the exam can be administered, every member of the graduate faculty of the department must receive written notification.

1) The Written Exam - Part 1 of the comprehensive is a written exam in which the student must respond to questions submitted by the faculty. These questions are solicited from the entire graduate faculty of the Department by a memo sent by student's advisor who then administers the examination. The written comprehensive exam is normally taken during the third semester (for full-time students) and in no case should the student take this exam before accumulating 27 hours of completed course work including courses in progress. This exam may not be administered if the student has outstanding incomplete grades in any course work.

2) The Defense of the (GEOG 7900) Individual Research Project - Part 2 of the comprehensive exam is the defense of the individual research project (GEOG 7900)--the thesis or internship report. This exam is generally administered at the discretion of the advisor and the student. When the advisor is satisfied that the student's research and writing has progressed sufficiently the research document is provided to the other members of the independent research committee; if they agree that the document is ready for a defense, an exam is scheduled. The advisor must then notify, in writing, every member of the Department's graduate faculty of the date, time, place and the topic (title with abstract) of the defense.

Committees
Selection of the GEOG 7900 Research Project Committee: All GEOG 7900 Research Projects are evaluated by a committee of faculty. Committees must have a minimum of three members composed of the graduate faculty of the department--or related departments. Additional members are acceptable and in many cases outside members, other departments or internship coordinators from off-campus agencies, are advisable.

Thesis
A common research experience is not appropriate for all students. Instead, students should pursue research experiences that are appropriate to departmental faculty resources, individual student’s programs, and the availability of opportunities that exist to work with allied agencies or clients on or off campus. One of three options, depending on the previously stated stipulations, will be available: 1) a research experience similar to that of a traditional academic thesis; 2) a research experience which involves a paid internship funded by and arranged with a public or private agency or client; and 3) a research experience involving an internship that is not funded, but arranged with a public or private agency or client. Each of these options fulfills program requirements equally. Each will produce a finished, quality research effort of thesis quality.

Not every student can expect to engage in a paid internship because the number of students frequently exceeds a matching number of opportunities funded in that manner. Unpaid internships provide the same caliber of experience and training in an applied environment. In some cases, that experience may relate student with non-profit agencies or social services that simply do not have the resources to fund an internship. In either case, the topic of the internship is defined by the client’s problem or needs.

Not every student can expect to develop the thesis option, but it does provide a choice for the student to pursue a research problem in a direction of his/her individual interest. Students who ultimately plan to pursue a Ph.D. degree might be more inclined and encouraged toward that option. The same is true of students who wish to complete their master’s program with that kind of individual research activity. In all cases, students must work closely with their advisor and program committee to choose the option which best fits both their particular program and prevailing circumstances.

COURSES IN GEOGRAPHY

GEOG 5040. Transportation Topics. (3) Prerequisite: consent of Department. Investigation of special topics in transportation including: transit systems, mobility and travel patterns, land use/transportation interface, air pollution, and information systems. (Spring) (Alternate years)

GEOG 5101. Cartographic Techniques. (3) Prerequisite: GEOG 2100. Preparation of maps, figures and charts at a professional level of competence. Techniques to be emphasized include desktop mapping with computers, high resolution imagesetting output, color separation techniques which include computer separations as well as scribing and various related photographic processes. Two laboratories of three hours each per week. (Spring)

GEOG 5102. Cartographic Design and Map Construction. (3) Design process and basic map construction techniques with particular emphasis on the graphic elements of map design, planning map design, creating visual hierarchies, the uses of color, and basic mechanical color separation. (Fall)

GEOG 5103. Computer Mapping. (3) Prerequisites: GEOG 2100 and CSCI 1100 or 1201 and its lab, or consent of instructor. Automated methods of gathering,
storing, manipulating and displaying spatial data. Emphasis on the use of existing software and the design and implementation of geographic data structures and algorithms. (Spring)

GEOG 5108. Sport, Place and Development. (W) (3) Prerequisites: GEOG 1105. Examines sport and its impact on the landscape of cities and communities. Implications of sport are examined in terms of urban use, urban social structure, markets, franchise movement and expansion, urban politics, its role in defining sense of place, and its impact on the development of communities and regions. (Spring)

GEOG 5120. Introduction to Geographic Information Systems. (4) Prerequisite: consent of instructor. Development, current state-of-the-art and future trends in geographic information processing with emphasis on data gathering, storage, and retrieval, analytical capabilities and display technologies. A laboratory component will include development and completion of an applied GIS research project. Additional requirements for graduate credit. Three lecture hours, one two-hour lab per week. (Fall)

GEOG 5130. Advanced Geographic Information Systems. (4) Prerequisite: GEOG 5120 or consent of instructor. Advanced GIS study with emphasis on (1) advanced skills for database development and management; (2) spatial analysis and modeling; and (3) Macro language programming and user interface design. Three lecture hours and a two-hour lab session each week. (Spring)

GEOG 5155. Retail Location. (3) Spatial attributes of retailing and related activities. Location patterns, store location research, trade area delineation and consumer spatial behavior. (Spring)

GEOG 5160. The Geography of Transportation Systems. (3) Geographical and human factors that affect the movement of goods and people from place to place. Emphasis on transportation routes and networks, commodity flow patterns and the locational implications of freight rates. (Spring)

GEOG 5210. Urban Planning Methods. (3) Prerequisite: GEOG 5205 or consent of the instructor. Scope and methods of urban planning. Emphasis on analytical techniques, projections, and data sources used in developing comprehensive planning tasks and strategies. (Fall)

GEOG 5220. Urban Planning Analysis. (3) Population data sources; measuring population change; elementary projection and estimation techniques; spatial sampling; migration; survey design; applications in the public and private sectors. (Fall)

GEOG 5250. Transportation Policy Formulation. (3) Prerequisite: consent of Department. Structure of transportation policy at federal, state, and local levels including policies concerning highway financing and investments, congestion, safety, and use and development, energy, transit, and the provision of intercity services. (Fall) (Alternate years)

GEOG 5255. Transportation Analysis Methods. (3) Prerequisite: consent of department; statistics recommended. Procedures for analyzing the operation and performance of transportation systems; includes network planning models, minimum path algorithms and assignments; energy, air pollution, and activity analysis models; and research approaches, data sources, time and activity budgets, infrastructure condition and needs assessment. (Spring) (Alternate years)

GEOG 5270. Evaluation of Transportation Impacts. (3) Prerequisite: consent of Department. Methods and case studies for evaluating impacts and benefits of transportation investments including site-level impact analysis; project, corridor, and area scales; multi-modal evaluation and examination of mutually exclusive alternatives. (Fall) (Alternate years)

GEOG 5405. Urban Field Geography. (6) Prerequisite: six hours of urban-related undergraduate courses or permission of instructor. Intensive field studies of cities of the Carolinas, including one-day and overnight trips to cities of the mountains and coastal areas. Emphasis on day study trips within the Piedmont. Exercises include land-use mapping, trip journals, interviews and comparisons of the results of zoning and urban development practices within satellite cities of the Charlotte Metropolitan Statistical Area. (Summer)

GEOG 6000. Topics in Economic Geography. (3) Major topics in the location of economic activity. May be repeated for credit as topics vary. (Yearly) (Evenings)

GEOG 6005. Topics in Urban Geography. (3) Major topics in the form and structure of urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. (Yearly) (Evening)

GEOG 6010. Topics in Political Geography. (3) Major topics in the spatial aspects of political systems with special emphasis on urban and regional spatial patterns examined generally and in a specific local occurrence. May be repeated for credit as topics vary. (On demand)

GEOG 6015. Topics in Regional Geography. (3) Intensive examination of major spatial questions in a given region. May be repeated for credit as topics vary. (On demand)

GEOG 6030. Topics in Geographic Techniques. (3) Cartographic, remote sensing, quantitative techniques or
field techniques. May be repeated for credit as topics vary.  
(On demand)

GEOG 6100. Quantitative Analysis in Geography. (3)  
Multiple regression, trend surface, factorial analysis, cluster analysis, discriminant analysis. (Fall) (Evenings)

GEOG 6101. Store Location Research. (3) Prerequisite: GEOG 6100 or consent of instructor. Market area analysis and site evaluation methods, including the application of multivariate statistical models, spatial interaction-gravity models, and location-allocation techniques to the retail location analysis task. (Spring)

GEOG 6102. Site Feasibility Analysis. (3) Prerequisite: consent of instructor. Examination of factors affecting the feasibility of land parcels for commercial and residential development with emphasis on the physical evaluation of a given site, the market support for its intended use and the financial support for the proposed development. (Fall)

GEOG 6103. Real Estate Development. (3)  
Examination of the real estate development process. Identification and evaluation of the critical assumptions and issues related to market and site feasibility, financial feasibility, planning, acquisition, construction, and operation of economically viable commercial real estate projects. (Fall or Spring)

GEOG 6104. Industrial Location. (3) Addresses factors influencing the location of industrial and service activities. Classical theories of industrial location are augmented with contemporary interpretations of the economic landscape. Emphasis is placed on theoretical foundations and new developments in industrial location theory, patterns and trends of industrial location, the site selection process, community impacts of locational decision-making, and the role of governments. Patterns and trends are examined in regional, national, and international perspectives. (Fall, Alternate Years)

GEOG 6106. Urban Planning: Theory and Practice. (3) Alternative planning theories and application of theories in urban planning practices. (Alternate years)

GEOG 6110. Cartographic Preparation and Analysis. (3) Cartographic design and analysis of qualitative and quantitative data. Emphasis on preparation of maps, figures and charts. Techniques include scribing and various photographic processes. Two three-hour labs each week. (On demand)

GEOG 6116. Applied Regional Analysis. (3) Prerequisite: Basic computer skills including spreadsheets. Introduction to methods and techniques used in regional analysis. Topical areas include data sources and collection, regional delineation, community and regional profiles, regional accounts, methods of analysis and impact assessment. Topics are discussed in terms of theory, use, and role in economic geography and regional development. Emphasis is placed on application of economic and demographic methods at the regional level. (Spring, Alternate Years)

GEOG 6200. Research Design Fundamentals. (3)  
Scientific research and problem solving. Problem identification, bibliographic search, data sources and collection, techniques selection and preparation of reports and proposals. (Spring) (Evenings)

GEOG 6201. Analysis and Presentation of Research Data. (3) The student is required to complete a research project. Topics such as research critiques, preparation and presentation of research reports, and the development of geographic thought are considered. (Fall) (Evenings)

GEOG 6600. Seminar in Geography. (3) Study of the current trends in geographic thought and research methods. Pass/No Credit grading. (On demand)

GEOG 6615. Advanced Seminar in Spatial Decision Support Systems (SDSS). (4) Prerequisite: GEOG 5120 or consent of instructor. Theoretical aspects of spatial DSS including technical, social, political and psychological consideration; systems design; systems manipulation; and case studies. Three hours of lecture and one two-hour lab per week. (Fall)

GEOG 6800. Directed Problems in Geography. (1-4)  
Individual research into geographic topics. May be repeated one time. (On demand)

GEOG 7900. Individual Research Project. (6)  
Individual research report based on directed study of a topic of geographic significance. Pass/No Credit/ Unsatisfactory grading. (Fall, Spring)

GERONTOLOGY

Interdisciplinary Program in Gerontology  
103 Macy Building  
704-687-4520  
http://www.uncc.edu/geront

Degrees
M.A. (Concentration in Planning and Administration), Certificate

Director and Coordinator
Dr. Dena Shenk

Graduate Faculty
Dana Bradley, Assistant Professor  
Paul Foos, Professor  
Elise Fullmer, Associate Professor  
JoAnn Lee, Associate Professor  
William J. McAuley, Professor
The Master of Arts in Gerontology is designed to prepare graduates with the knowledge and skills to fill a wide variety of positions in the developing field of aging. The Planning and Administration Concentration will best meet the needs of those planning to direct programs for older adults, and those interested in the development and administration of programs.

Potential students are encouraged to apply to begin the program in the fall semester, although applications are reviewed throughout the year. The program can be completed on either a full-time or part-time basis with all required courses and a selection of electives offered in the evening. Some courses may require prerequisites and it is the responsibility of the candidate to meet any prerequisites (e.g., statistics is a required prerequisite for GRNT 6201). Students will work in conjunction with their adviser and graduate committee to design and implement their individual program.

**Additional Admission Requirements**
- Grade point average of at least 2.75 overall and 3.0 in courses in Gerontology.
- Satisfactory GRE or MAT scores.
- Three letters of recommendation from persons familiar with the applicant’s personal and professional qualifications.
- Essay describing the applicant’s relevant experience and objectives in undertaking graduate study in Gerontology.

**Prerequisite Requirements**
Completion of at least one broad-based undergraduate course in Gerontology or the Professional Development Program in Gerontology previously offered through the Office of Continuing Education, Extension and Summer Sessions at UNC Charlotte.

**Degree Requirements**
The Gerontology Program requires 36 semester hours of graduate course work.

**Core Courses** (required, 21 hours)
- GRNT 6600 Current Issues in Gerontology (3)
- SOCY 6130 Sociology of Aging: Theories and Research (3)
- PSYC 6124 Psychology of Aging (3)
- NURS 6275 Health Promotion and Wellness for Older Adults (3)
- GRNT 6201 Research and Methods in Aging I (3)
- GRNT 6202 Research and Methods in Aging II (3)
- GRNT 6400 Practicum (3)

**Thesis or Applied Project**
In addition to these core courses, students will complete either:
- The thesis option entails 9 hours of elective credits and 6 hours of thesis credits. The student must also pass an oral defense of both the thesis proposal and thesis, and oral comprehensive exams at the time of the thesis defense.
- The applied project option entails 15 hours of elective courses. Three elective credits will generally be earned for the Applied Project, taken as GRNT 6800, Independent Research Study. The student must also pass an oral defense of both the applied project proposal and the project, and oral comprehensive exams at the time of the project defense.

**Elective courses** (will include)
- GRNT 5050 Topics in Gerontology (1-4)
- GRNT 5250 Programs and Services for the Aging (3)
- GRNT 6800 Independent Research Study (3 can be repeated, up to 6 credits can be counted towards MA electives)
- GRNT 6210/MPAD 6210 Aging and Public Policy (3)
- GRNT 6211/MPAD 6211 Administration of Aging Programs (3)
- HPKD 5232 Physiology of Human Aging (3)
- MPAD 6128 Public Policy Analysis and Program Evaluation (3)
- MPAD 6172 Administration of the Health Care System in the U.S. (3)
- NURS 6115 Health Planning in the Health Care System (3)
- SOCY 5134 Families and Aging (3)
- SOCY 5150 Older Individual and Society (3)

**Committee**
Each student should select his/her Graduate Committee before completion of GRNT 6201.

**CERTIFICATE**
The Graduate Certificate in Gerontology is designed to provide graduate education in Gerontology for those who already have a graduate degree in another field or those currently completing a graduate degree in another field, who are interested in working with older adults. It requires completion of a set of core and elective courses related to the study of aging. Applications for admission the Graduate Certificate Program in Gerontology will be considered as they are received and admissions will be
ongoing. Students are admitted to the Graduate School in a special category for certificate students.

Additional Admission Requirements
In addition to the general requirements for admission to a certificate program, applicants must provide official transcripts of all baccalaureate and graduate work attempted.

Three letters of recommendation are required from persons familiar with the applicant’s personal and professional qualifications.

Degree Requirements
The Graduate Certificate Program requires completion of a minimum of 15 semester hours of graduate course work related to aging and older adults.

Core Course
GRNT 6600 Current Issues in Gerontology (3)

Electives
Primary Electives (choose 2-3 of the following):
PSYC 6124 Psychology of Aging (3)
SOCY 6130 Sociology of Aging: Theories and Research (3)
NURS 6275 Health Promotion and Wellness for Older Adults (3)

Secondary Electives (choose 1-2 from the following):
GRNT 5050 Topics in Gerontology (1-4)
GRNT 5250 Programs and Services for the Aging (3)
GRNT 6210/MPAD 6210 Aging and Public Policy (3)
GRNT 6211/MPAD 6211 Administration of Aging Programs (3)
HPKD 5232 Physiology of Human Aging (3)
MPAD 6128 Public Policy Analysis and Program Evaluation (3)
MPAD 6172 Administration of the Health Care System in the U.S. (3)
SOCY 5134 Families and Aging (3)
SOCY 5150 Older Individual and Society (3)

Secondary electives may also be chosen from other appropriate courses as offered with the approval of the Gerontology Graduate Coordinator.

Transfer Credit
Transfer credit is not accepted toward a Graduate Certificate Program in Gerontology.

COURSES IN GERONTOLOGY

GRNT 5050. Topics in Gerontology. (1-4)
Investigation of specific issues in Gerontology, either from the perspective of a single discipline or from a multidisciplinary perspective. May be repeated for credit as topics vary. (On demand)

GRNT 5250. Aging Programs and Services. (3)
Examination of federal, state and local framework of services and programs for the aging. Graduate students required to complete a more extensive final paper and to present their project presentation as a grant proposal. (On demand)

GRNT 5260. Women: Middle Age and Beyond. (3)
Position of older women in society and the particular problems and issues for women as they age. (Same as WMST 5260) (On demand)

GRNT 5270. Intergenerational Relationships & Programs. (3)
Exploration of the importance of and consequences of intergenerational relationships and the range of programming currently available to encourage interaction between people of different ages. (On demand)

GRNT 6600. Current Issues in Gerontology. (3)
Study of current issues and topics in the field of aging from an interdisciplinary perspective; an ethical framework will be used to examine the issues. (Fall)

GRNT 6201. Research and Methods in Aging I. (3)
Prerequisite: Statistics. Examination of variety of qualitative and quantitative methods used in research on aging and analysis of Gerontology research from a range of disciplines. Students will develop a working draft of their thesis-applied project proposal. (Spring)

GRNT 6202. Research and Methods in Aging II. (3)
Prerequisite: GRNT 6201. Examination of the variety of qualitative and quantitative methods used in evaluation research in applied settings. Students will develop an evaluation project plan. Gerontology students will also refine their thesis/applied project proposal. (Fall)

GRNT 6238/PHIL 6238. Intergenerational Issues of Justice. (3)
Examination of intergenerational issues of justice in public policy toward the elderly and their health care needs. Issues of justice and morality will be explored in terms of the distribution of limited health care resources among competing age groups. (On demand)

GRNT 6210/MPAD 6210. Aging and Public Policy. (3)
Examination of the public policy making process with attention to aging policy. Consideration of determinants of aging policy and institution and actors in the policy making process and piecemeal development of legislation will be analyzed as factors related to the making of policy for the aged. (Alternate years)

GRNT 6211/MPAD 6211. Administration of Aging Programs. (3)
Focus will be implementation of public policies and programs for the aged and the development and administration of these programs. Students will become familiar with the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be taken into consideration. (Alternate years)
GRNT 6400. Practicum. (3) Completion of a field-based educational experience which relates to the student’s career goals and objectives. Pass/Fall grading. (Summer)

GRNT 6600. Current Issues in Gerontology. (3) Study of current topics and issues in the field of Gerontology from an interdisciplinary perspective. An ethical framework will be used to examine the issues. (Fall)

GRNT 6800. Independent Research in Gerontology. (3) Graduate students meet individually or in small groups with the instructor and will complete readings and/or research on a topic in gerontology according to a contract. Attendance at lectures of an undergraduate class in Gerontology may be included among course requirements. May be repeated for credit up to a maximum of six hours. (On demand)

GRNT 6999. Master of Arts Thesis. (3 or 6) Prerequisite: application for admission to the thesis option. A completed paper and oral presentation are required. Pass/Fall grading. (Fall, Spring, Summer)

GRNT 7999. Master of Arts Residency. (1) Pass/Fail grading. (Fall, Spring, Summer)

HISTORY

Department of History
113 Garinger Building
704-547-4633
http://www.uncc.edu/colleges/arts_and_sciences/history/

Degree
M.A., Ph.D. (joint degree with the University of Aberdeen)

Coordinator
Dr. Daniel S. Dupre

Graduate Faculty (UNC Charlotte)
Mario Azevedo, Professor
Jürgen Buchenau, Associate Professor
Kathleen Donohue, Associate Professor
Daniel Dupre, Associate Professor
Karen Flint, Assistant Professor
John Flower, Assistant Professor
Donna Gabaccia, Professor
David Goldfield, Professor
James Hogue, Assistant Professor
Lyman Johnson, Professor
Cynthia Kierner, Professor
Gregory Mixon, Assistant Professor
Daniel Morrill, Professor
Steven Sabol, Assistant Professor
John Smail, Professor
Heather Thompson, Assistant Professor
Peter Thorsheim, Assistant Professor

MASTER OF ARTS DEGREE

Program of Study
The Master of Arts Program in History at UNC Charlotte is designed to give motivated students an opportunity to pursue advanced studies in close collaboration with accomplished scholars. The program emphasizes the development of methodological, literary, and conceptual skills that graduates can employ as students in a doctoral program, as professional oriented history teachers in secondary schools, or as citizens more acutely aware of the historical evolution of their society. Offering both day and evening courses, the Department of History attracts a diverse group of traditional and non-traditional students. Candidates may pursue the M.A. degree on either a full-time or part-time basis.

The Department offers courses in African, Asian, European, Latin American, and United States history, with particular expertise in the following areas:
- American Society--Private Life and Public Culture
- American South, Old and New
- Comparative Industrialization and Urbanization
- European Culture and Politics, 1550-1950
- Gender, Race, and Slavery in Comparative Perspective

The Department also offers a concentration in the field of Public History, with an emphasis on museum studies, historic preservation, and urban studies.

Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are ordinarily required for admission to the M.A. program in History:
1) A minimum undergraduate GPA of 3.0 in History or a related discipline.
2) Acceptable performance on the verbal and math portions of the GRE.

Degree Requirements
The Master of Arts degree in History requires completion, with a GPA of 3.0 or better, of at least 30 hours in approved graduate courses. These courses must include at least 24 credit hours in History, of which at least 15 hours are in seminars or colloquia open only to graduate students, and no more than 6 hours in individually designed readings or research courses. Students taking the comprehensive examination may take 3 hours of exam preparation and students completing a thesis may take 6 hours of thesis preparation toward their 30 hours.
Students concentrating on public history must complete 30 hours of required and elective coursework, 3 hours for an internship in some area of public history, and 3 hours of thesis work for a total of 36 hours.

Students must complete all degree requirements, including the comprehensive examination or thesis defense, within six calendar years of first enrollment in the program.

All students in the program are expected to maintain an overall B (3.0) average. Students who do not meet this expectation will be subject to suspension on recommendation of the Graduate Committee of the Department of History.

**Admission to Candidacy Requirements**

An Admission to Candidacy form must be submitted during the semester preceding the one in which the student plans to complete the degree requirements, either by defending a thesis or taking a comprehensive examination.

**Assistantships**

The Department of History supports approximately eight students with teaching assistantships, which are currently funded at $8,000 per year. The Department also has a modest pool of scholarship money for in-state students and one tuition waiver for out-of-state students. Assistantships and other financial aid are awarded on a strictly competitive basis.

In addition, students may obtain limited financial support for students internships, summer teaching in the Department, archival work in the library’s special collections, and teaching opportunities at the local community college. Students doing thesis research may receive modest travel grants from the Department.

**Internships**

Internships may be available with the Mecklenburg County Historical Commission and the *Journal of Urban History*, both of which are headed by members of the Department of History. The Museum of the New South, located in uptown Charlotte, employs students for research and design. Students also may serve as research assistants for members of the Department of History. See the Graduate Coordinator for other research opportunities.

**Core Courses**

All candidates for the degree must complete HIST 6693 (Historiography and Methodology) with a grade of B (3.0) or better. In addition, at least 6 hours of a student's History courses are expected to pertain to fields other than United States history.

In addition to those requirements, candidates concentrating on public history must complete HIST 5300 (Introduction to Public History), HIST 6310 (Introduction to Museum Studies) and HIST 6320 (Introduction to Historic Preservation).

**Electives**

Students may elect to take up to 6 hours of graduate-level course work in disciplines other than History. Candidates seeking graduate-level teacher certification may use the elective option to take courses in professional education selected in consultation with the College of Education. If a student needs more than 6 hours to satisfy certification requirements, those hours will be added to the total required for the M.A. in History.

**Advising**

Students may not register for graduate-level courses without the permission of the Department of History. Consequently, students must be advised by the Graduate Coordinator prior to registering for courses each semester, as well as prior to filing their admission to candidacy form and application for degree.

**Transfer Credit**

No more than 6 transferred hours may be approved for application to the requirements for the degree.

**Language Requirement**

Although students are not required to demonstrate proficiency in a foreign language, they are expected to be able to use whatever languages they need to pursue their research interests.

**Thesis/Comprehensive Examination**

After completing the required courses, students must either prepare a Master's thesis based on original primary research or take three comprehensive written examinations based on reading lists compiled in consultation with faculty members. In both cases, the candidate must then pass an oral examination based on their thesis or written examination.

An Examining Committee, consisting of two graduate faculty members from the Department of History and a third member selected from History or another department, oversees the student's thesis work or conducts the comprehensive written and oral examinations.

**Courses in History**

**HIST 5000. Problems in American History. (3)**

Prerequisite: HIST 2100 or permission of the department.

A colloquium designed around a problem in American history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. *(Fall, Spring) (Evenings)*

**HIST 5001. Problems in European History. (3)**

Prerequisites: HIST 2100 or permission of the
department. A colloquium designed around a problem in European history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. (Yearly, Summer) (Evenings)

**HIST 5002. Problems in Non-Western History. (3)**
Prerequisite: HIST 2100 or permission of the department. A colloquium designed around a problem in non-Western history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. (Yearly)

**HIST 5300. Introduction to Public History. (3)**
Prerequisite: permission of the department. This course will provide an overview of the main subfields in the field of Public History. Students will learn the fundamentals of Museum Studies, Historic Preservation, and other fields at the discretion of the instructor. This course is the first in a sequence of required courses for graduate students doing the Public History concentration; it is also open to advanced undergraduates with the consent of the department. (Yearly)

**HIST 6000. Topics in History. (3)**
Prerequisite: permission of the department. Intensive treatment of a period or broader survey of a topic, depending on student needs and staff resources. May be repeated for credit as topics vary. (Fall, Spring) (Evenings)

**HIST 6196. Urban Systems for School Administrators. (3)** Corequisite: POLS 6196. An interdepartmental, team-taught course which consists of a survey of the causes and consequences of urbanization in the United States with particular attention to the urban South. Urbanization is treated as a system linking historic, political, economic, and social factors, particularly since 1945. (Summer)

**HIST 6200. History Teaching Alliance Institute. (3)**
Open under special arrangement. Pass/No Credit grading only. (On demand)

**HIST 6210. Early America, 1607-1820. (3)**
Prerequisite: permission of the department. Development of American institutions from the period of English settlement through the establishment of Republicanism under the Constitution. (Alternate years)

**HIST 6215. Jacksonian America, 1820-1848. (3)**
Prerequisite: permission of the department. Examination of important economic, social and political changes including industrialization, the rise of the Democratic Party and reform movements. (Alternate years)

**HIST 6220. The Old South. (3)**
Prerequisite: permission of the department. Evolution of the Old South from the 17th century to its collapse in the Civil War and Reconstruction, focusing on southern distinctiveness and the tension between democracy and slavery. (Alternate years)

**HIST 6225. The New South. (3)**
Prerequisite: permission of the department. Continuity and change in the South from the late-19th century, including industrialization, politics, class and race relations, and religion. (Alternate years)

**HIST 6230. European Social History. (3)**
Prerequisite: permission of the department. Development of American institutions, gender relations and social protest including why certain schools of thought such as modernization or Marxism become popular at particular historical moments. (Alternate years)

**HIST 6240. U.S. Political and Economic History, 1865-1939. (3)**
Prerequisite: permission of the department. Emergence of the modern industrial economy and the concomitant development of a large bureaucratic federal government including big business, technological innovation, the labor movement, progressive reform and regulatory policies. (Alternate years)

**HIST 6250. Comparative Slavery and Race Relations. (3)**
Prerequisite: permission of the department. Slavery in the New World through its abolition including Indian and African slaves, the slave trade, the economics of slavery, and the impact of slavery on modern race relations in the Americas. (Alternate years)

**HIST 6265. Cold War America. (3)**
Prerequisite: permission of the department. Domestic and foreign policy problems accompanying the post-World War II struggle between East and West, Communism and capitalism including McCarthyism, modern technology, foreign aid, Korea, Vietnam, civil rights, gender roles and natural resources. (Alternate years)

**HIST 6300. Introduction to Museum Studies. (3)**
Prerequisite: permission of the department. This course introduces students to the management, curatorial, public relations, and fundraising aspects of historical museums and related historical sites. These skills will be acquired through readings, term projects, and a “hands-on” experience at local museums and historical sites. (Yearly)

**HIST 6320. Introduction to Historic Preservation. (3)**
Prerequisite: permission of the department. This course is an introduction to the theory and practice of identifying, preserving and restoring buildings, sites, structures and objects in the historic built environment of the United States. (Yearly)

**HIST 6601. Graduate Colloquium. (3)**
Prerequisite: permission of the department. A colloquium focused on a theme or period. Assigned readings, short papers and reports directed toward developing research and writing skills. May be repeated for credit. (Fall, Spring) (Evenings)

**HIST 6693. Historiography and Methodology. (3)**
Prerequisite: permission of the department. A study of
historians and their philosophical and methodological approaches. Required of all M.A. candidates. *(Yearly) (Evenings)*

**HIST 6698. Introduction to Historical Writing. (3)** Prerequisite: permission of the department. Seminar on the process of thesis writing including thesis proposals, primary source materials, rules of evidence, structure of an argument, and organization of the thesis and its chapters. May be repeated for credit. *(On demand)*

**HIST 6894. Readings in History. (3)** Prerequisite: prior written consent of instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conference with a staff member. May be repeated for credit. *(Fall, Spring) (Evenings)*

**HIST 6901. Directed Readings/Research. (3)** Prerequisite: prior written consent of instructor and graduate coordinator. Graduate students will meet individually or in small groups with the instructor and will be assigned readings and/or research on a theme that relates to the lectures of an undergraduate class. Attendance at the lectures is a course requirement. May be repeated for credit. *(Fall, Spring, Summer)*

**HIST 6997. Directed Research. (3)** Prerequisite: prior written consent of instructor. Investigation of a historical problem culminating in a research paper. May be repeated for credit. *(On demand)*

**HIST 6999. Thesis. (3 or 6)** May be repeated by permission, if taken for three hours credit. Six hours of Thesis may be taken during a single semester. Appropriate research and written exposition of that research is required. *(On demand)*

**HIST 7999. Master's Degree Residence. (1)**

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**PH.D. in HISTORY DEGREE**

**Graduate Faculty (at University of Aberdeen)**
Mike Broers, Reader  
Terry Brotherstone, Senior Lecturer  
Christoph Dartmann, Lecturer  
David Ditchburn, Lecturer  
Paul Dukes, Professor  
Marjory Harper, Senior Lecturer  
Howard Hotson, Lecturer  
Rene Leboutte, Professor  
David Longley, Lecturer  
Alastair Macdonald, Lecturer  
Allan Macinnes, Professor  
Andrew Mackillop, Lecturer  
William Naphy, Lecturer  
Jane Ohlmeyer, Senior Lecturer  
Richard Oram, Lecturer  
Frederik Pedersen, Lecturer  
Richard Perren, Senior Lecturer  
Edward Ranson, Lecturer  
David Smith, Lecturer  
Robert Tyson, Senior Lecturer  
Rosemary Tyzack, Lecturer  
Oonagh Walsh, Lecturer  

**Program of Study**
This program combines the M.A. at UNC Charlotte, or an accepted institution, with a Ph.D. conferred by the University of Aberdeen in Scotland. After attaining their Master's degrees, qualified students will spend one year in Charlotte, one year in Aberdeen, and a third year at either of these two institutions. Ph.D. candidates will work with faculty and utilize research facilities in both America and Europe. Teaching and research assistantships are available on a competitive basis at both universities.

Both universities offer a wide range of courses and fields of specialization. As indicated above, the Department of History at UNC Charlotte possesses particular expertise in United States history, the history of the American South, and the comparative history of medicine, race, gender, urbanization, and industrialization. The Department of History at the University of Aberdeen possesses particular expertise in non-Anglocentric British history; the North Sea and Baltic states, including Russia; diet, disease, and death; gender; and the relationship between Scotland and America.

**Additional Requirements for Admission**
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in History at the doctoral level:
1) A GPA of 3.5 or better in all Master's level courses.
2) Above average performance on the math and verbal portions of the G.R.E.
3) Submission of the applicant's M.A. thesis or a substantial research paper.
4) The student must complete applications to both UNC Charlotte and the University of Aberdeen.

**Degree Requirements**
The joint Ph.D. in History requires successful completion of a dissertation proposal, a qualifying examination, and a doctoral dissertation. Course work for the joint Ph.D. will consist primarily of directed reading and research in preparation for writing the dissertation.

All degree requirements, including the dissertation defense, should be completed in 3-4 years. All requirements must be completed within six years of enrolling in the program.
Assistantships
Teaching and research assistantships are available at both universities on a competitive basis. Applications for assistantships at UNC Charlotte should be submitted simultaneously with those for admission to the joint Ph.D. program.

Advising
Students may not register for graduate-level courses without the permission of the Department of History, which means that the graduate coordinator must register them for courses each semester. Regular advising by the graduate coordinator is especially essential to arrange continuous funding for doctoral students in Charlotte and in Aberdeen.

Qualifying Examination
Students are required to complete both written and oral qualifying examinations during their second semester at UNC Charlotte. The written examination will consist of a dissertation proposal; the oral examination will cover both the student's general field of specialization and the proposed dissertation topic.

Language Requirement
Although students are not required to demonstrate proficiency in a foreign language, they must possess the foreign language skills necessary to do primary research in their intended field of specialization.

Dissertation Defense
Doctoral dissertations are not to exceed 100,000 words in length. The dissertation defense is a final oral examination at which a student presents and defends his/her research before a committee of Aberdeen and UNC Charlotte faculty. The defense committee can reject the dissertation and instruct the student to revise the work or accept it and thereby confer the Ph.D.

COURSES IN HISTORY

(Doctoral students only)
HIST 8894. Readings in History. (3 or 6) Prerequisite: doctoral student with prior written consent of the instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conferences with a designated member of the graduate faculty. May be repeated for credit. (Fall, Spring, Summer)

LIBERAL STUDIES

Department of Liberal Studies
103 Macy Building
704-547-4312

Coordinator
Dr. Dale Grote

Degree
M.A.

Program of Study
The Master of Arts degree program in Liberal Studies is designed primarily for adults seeking to enhance their general education in the liberal arts at the graduate level. It provides a flexible, multidisciplinary framework to accommodate the varied undergraduate backgrounds and personal interests that students bring to the program. The curriculum draws upon the full range of the humanities, social sciences, and natural sciences. The emphasis is on liberal arts education rather than on specialized study or professional training.

For recent recipients of the baccalaureate degree, the Liberal Studies program may provide the insight needed to make an informed career choice, or it may enhance opportunities in a career already launched. For returning students, graduate liberal studies may renew ties with university life or lead to a change of career. For persons with significant work experience, the program offers a chance to integrate the life of the mind with that of the workplace. Just as students come to the Liberal Studies program from a variety of fields, so they pursue a variety of careers after graduation. The most widely represented are in business, education, government, law, and social services.

Although the Liberal Studies program is not exclusively an evening program, the majority of courses are offered at times convenient for working adults. It is possible to earn the degree in a timely fashion through evening courses only.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Liberal Studies:

1) A GPA of at least 2.75 on academic work beyond high school and 3.0 for courses prerequisite to the area of proposed graduate study.
2) Satisfactory scores on the Miller Analogies Test or the Verbal and Analytical portions of the Graduate Record Examination.
3) A two-page essay describing the applicant's objectives in undertaking graduate work in Liberal Studies.
4) A resume of employment history or volunteer experience (for applicants who have been out of school for at least five years or whose baccalaureate degree was delayed).
5) Acceptance into the program is contingent on an interview with members of the Liberal Studies Faculty Advisory Committee.
Degree Requirements
The master's program in Liberal Studies requires a minimum of 30 semester hours of graduate work with grades of A or B, including at least 15 semester hours in courses open only to graduate students. A course in which a student receives a grade of ‘C’ is not allowable as part of the 30 required hours.
The program begins with two core courses that give students some common grounding in the issues of liberal arts education. Each student then chooses a program emphasis by completing at least four courses that focus on a common theme. Degree requirements also include a Liberal Studies elective course and two elective courses that can be taken in any department in the College of Arts and Sciences. The program concludes with a seminar, a master's essay or project, and a comprehensive examination. The requirements are outlined below:

Core Courses
- LBST 6101 The Liberal Arts Tradition (3)
- LBST 6102 Ideas Across the Disciplines (3)

Program Emphasis
Four related courses focusing on a theme developed by the student and faculty advisor 12 hours

Liberal Studies Elective 3 hours

General Electives 6 hours

Concluding Seminar
- LBST 6600 Liberal Studies Seminar (3)

No more than 6 hours of independent study may be applied to the degree. Students requesting independent study must have successfully completed at least 12 semester hours in the program, including LBST 6101 and 6102. A form for such requests is available in the Coordinator's office and must be completed and the study approved in advance of registration.

Comprehensive Examination
Each candidate concludes the program with a comprehensive examination taken during the final semester of course work. The examination is a part of the concluding seminar and is individually designed, based on each student's program. It allows the student to integrate material from a variety of disciplines and to demonstrate understanding of the scope of Liberal Studies.

Assistantships
A limited number of graduate assistantships are available each year. In order to be fully competitive, applications must be received by March 15. Application forms are available through the Graduate School.

Prizes
A Spring Prize of $250 is awarded annually for an outstanding paper or project completed for a LBST course. Only students admitted to the Liberal Studies program by the submission deadline for the prize are eligible.

Courses in Liberal Studies

LBST 6000. Topics in Liberal Studies. (3) Selected topics approached from interdisciplinary perspectives in the liberal arts. May be repeated for credit as topics change. Examples include interrelated courses forming program emphases on Language and Culture and on Religious Ideas in Physical Forms. (Fall, Spring)

LBST 6101. The Liberal Arts Tradition. (3) The concept of a liberal education and its relationship to human understanding as reflected in representative historical traditions, literature, art, and intellectual works. Examination of selected classics of the Western tradition and critiques through the use of works from other traditions and perspectives. (Fall, Spring)

LBST 6102. Ideas Across the Disciplines. (3) Enduring ideas and their impact on history, society and culture. Each semester a single idea is examined through a variety of writings spanning the liberal arts disciplines. Examples include the idea of nature, the idea of human nature, the idea of the democracy and the idea of citizen. (Fall, Spring)

LBST 6600. Liberal Studies Seminar. (3) An integration of the course work previously taken by each of the seminar members and the completion of a final essay or project. (Yearly)

Mathematics

Department of Mathematics
376 Fretwell Building
704-547-2580
http://www.math.uncc.edu/grad/

Mathematics Degrees
M.S., Ph.D.

Coordinator for Mathematics
Dr. Joel D. Avrin

Mathematics Education Degree
M.A.

Coordinator for Mathematics Education
Dr. Victor V. Cifarelli

Graduate Faculty
Robert Anderson
Joel Avrin
Animikh Biswas
The Master of Science Degree in Mathematics is organized into three concentrations: the concentration in General Mathematics, the concentration in Applied Mathematics, and the concentration in Applied Statistics. The concentration in General Mathematics is a robust but flexible program that allows a student to develop a broad background in Mathematics ranging over a variety of courses chosen from both pure and applied areas, or to tailor a program toward a particular focus that may not be as closely covered by our other degree concentrations, e.g. one that is interdisciplinary in nature. The concentration in Applied Mathematics develops analytical and computational skills focused toward applications of mathematics in the physical sciences as encountered in industry, government, and academia. The concentration in Applied Statistics provides theoretical understanding of, and training in, statistical methods applicable to particular areas of business, industry, government, and academia.

All candidates, regardless of which concentration is chosen, are required to take MATH 5143-5144 or STAT 5124-5127; MATH 7691 (or in the case of the General Mathematics concentration, a suitable/approved 7000 level course); and a comprehensive exam. Students may also choose a thesis option for 3-6 credit hours towards the required 30 semester hours.

CONCENTRATION IN GENERAL MATHEMATICS

The Master of Science degree concentration in General Mathematics is designed both to provide advanced skills and knowledge for persons seeking either positions in industry or in government, or teaching positions at the community college level, and to provide professional development to persons currently in such positions. Graduates are also prepared to enter directly into at least the second year of a Ph.D. program in mathematics, applied mathematics or statistics, depending on the particular course of study.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for the concentration in General Mathematics:

- Applicants must present evidence of the satisfactory completion of at least 27 semester hours of mathematics approved by the department Graduate Committee.
- A satisfactory score is required on at least the Quantitative portion of the Graduate Record Examination.
- It is recommended that the student have a basic knowledge of at least two of the areas of algebra, real analysis and topology.

Concentration Requirements
The Master of Science degree concentration in General Mathematics requires successful completion of at least 30 semester hours of graduate work approved by the department Graduate Committee including: MATH 5143 and 5144 or their equivalents, at least one course each from two of the groups I, II, III, and V, and at least 15 hours in 7000-level courses. No credit shall be given for 6000-level math courses. With the approval of the department Graduate Committee, one 3-hour, non-thesis 6000-level course in computer science of a theoretical nature may be applied toward the 15 hours. Candidates for the degree concentration must demonstrate, to the satisfaction of the department Graduate Committee, competence on general knowledge in at least three of five groupings of courses listed below. This may be accomplished by (a) successful performance on a written comprehensive examination or (b) successful completion of courses in these areas.
Group I Applied Mathematics
OPRS 5111 Linear Programming (3)
OPRS 5112 Non-Linear Programming (3)
OPRS 5113 Game Theory (3)
OPRS 5114 Dynamic Programming (3)
MATH 5165 Numerical Linear Algebra (3)
MATH 5172 The Finite Element Method (3)
MATH 5173 Ordinary Differential Equations (3)
MATH 5174 Partial Differential Equations (3)
MATH 5176 Numerical Methods for Partial Differential Equations (3)
MATH 7172 Partial Differential Equations (3)
MATH 7176 Advanced Numerical Analysis (3)
MATH 7177 Applied Optimal Control (3)
MATH 7178 Comp. Methods for Fluid Dynamics (3)
MATH 7273 Advanced Finite Element Analysis (3)

Group II Probability-Statistics
STAT 5123 Applied Statistics I (3)
STAT 5124 Applied Statistics II (3)
STAT 5126 Theory of Statistics I (3)
STAT 5127 Theory of Statistics II (3)
STAT 7027 Topics in Statistics (3)
STAT 7122 Advanced Statistics I (3)
STAT 7123 Advanced Statistics II (3)
STAT 7127 Linear Statistical Models (3)
STAT 7133 Multivariate Analysis (3)
MATH 5128 Applied Probability I (3)
MATH 5129 Applied Probability II (3)
MATH 7120 Probability Theory I (3)
MATH 7121 Probability Theory II (3)
MATH 7125 Stochastic Processes (3)

Group III Algebra-Topology
MATH 5163 Modern Algebra (3)
MATH 5164 Abstract Linear Algebra (3)
MATH 5181 Introduction to Topology (3)
MATH 7163 Modern Algebra I (3)

Group IV Analysis
MATH 5143 Analysis I (3)
MATH 5144 Analysis II (3)
MATH 7141 Complex Analysis I (3)
MATH 7143 Real Analysis I (3)
MATH 7144 Real Analysis II (3)

Group V Computer Science
All 5000- and 6000-level Computer Science courses.

Thesis
Completion of a thesis is optional. With the approval of the department Graduate Committee, a candidate may receive up to six of the 15 hours required at the 7000 level for the writing of a master's thesis on an approved topic. This thesis may be original work, work of an expository nature, or the mathematical formulation and solution of a particular industrial or business problem suggested by the career interests of the student. A candidate may receive no more than six of the hours required at the 7000 level for course and thesis work in computer science. If the thesis option is elected, the candidate will be required to defend his/her thesis in an oral examination.

Comprehensive Examination
A candidate must perform satisfactorily on an oral comprehensive examination over his/her program of study.

CONCENTRATION IN APPLIED MATHEMATICS

The Master of Science degree concentration in Applied Mathematics is designed to develop critical thinking and intuition, and to provide advanced work in the techniques of mathematical analysis and their application to the problems of industry and technology. Skills are developed to deal with problems encountered in industry, business, and governmental work; to hold leadership positions in industry or government work; to teach Applied Mathematics at the undergraduate or community college level; and to study Applied Mathematics leading to the Ph.D. degree.

Concentration Requirements
A candidate for the Master of Science degree concentration in Applied Mathematics must complete at least 30 semester hours of graduate work approved by the department Graduate Committee to include:

Core Requirements (21 semester hours)
1) MATH 5143 Analysis I (3)
2) One elective in Numerical Analysis selected from:
   MATH 5172 The Finite Element Method (3)
   MATH 5176 Numerical Methods for Partial Differential Equations (3)
3) One elective in Advanced Analysis selected from:
   MATH 7141 Complex Analysis I (3)
   MATH 7143 Real Analysis I (3)
   MATH 7144 Real Analysis II (3)
4) Two electives in Advanced Applied Mathematics selected from:
   MATH 7172 Partial Differential Equations (3)
   MATH 7176 Advanced Numerical Analysis (3)
   MATH 7177 Applied Optimal Control (3)
   MATH 7178 Computational Methods for Fluid Dynamics (3)
   MATH 7273 Adv. Finite Element Analysis. (3)

Electives (6 semester hours)
1) One advanced elective from:
   MATH 7141 Complex Analysis I (3)
   MATH 7143 Real Analysis I (3)
   MATH 7144 Real Analysis II (3)
   MATH 7172 Partial Differential Equations (3)
   MATH 7176 Advanced Numerical Analysis (3)
   MATH 7177 Applied Optimal Control (3)
MATH 7178 Computational Methods for Fluid Dynamics (3)
MATH 7273 Adv. Finite Element Analysis (3)
MATH 7893 Thesis (0-3)

2) One elective in Mathematics or a suitable area of application to be selected with the approval of the student's adviser. Suggested electives include:
   - OPRS 5113 Game Theory (3)
   - STAT 5123 Applied Statistics I (3)
   - CSCI 5131 Simulation (3)
   - MEGR 4111 Heat Transfer (3)
   - MEGR 4112 Intermediate Fluid Mechanics (3)
   - MEGR 6113 Adv. Conductive Heat Transfer (3)
   - MEGR 6141 Theory of Elasticity II (3)

Research Seminar (3 hours)
All candidates for the degree concentration must complete three hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application to a concrete problem of techniques identified in the literature or studied in other courses. All projects are subject to prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

Thesis
A student may choose to expand the work begun in MATH 7691 into a master's thesis by registering for three hours of MATH 7893 to fulfill the advanced elective requirement (1) described above. This thesis option affords the student the opportunity to do professional/scholarly work demonstrating proficiency in the area of Applied Mathematics.

Comprehensive Examination
Each candidate for the degree concentration in Applied Mathematics must perform satisfactorily on a final comprehensive examination. This examination will be set and administered by a committee appointed by the department Graduate Committee. It may be either in written or oral form, and it will cover those areas of study and/or research deemed appropriate by the committee.

CONCENTRATION IN APPLIED STATISTICS

The Master of Science degree concentration in Applied Statistics is designed to provide advanced skills and knowledge in the planning, design, testing, and implementation of statistical methods. Skills are developed to deal with problems encountered in statistical applications in business, industry and government; to hold administrative positions requiring planning and implementation of statistical analysis; to teach statistics at the undergraduate or community college level; and to study statistics leading to the Ph.D. degree.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for the concentration in Applied Statistics:

1) An overall GPA of at least 3.0 on all previous college work including a GPA of at least 3.0 in courses prerequisite to the area of applied statistics.

2) Evidence of undergraduate preparation in mathematics and computer science including: 12 semester hours of calculus at the level of MATH 1241/1242/2241/2242; 3 semester hours of linear algebra at the level of MATH 2164; 3 semester hours of differential equations at the level of MATH 2171; 6 semester hours of probability and statistics at the level of MATH 3122/3123; and 3 semester hours of computer programming at the level of CSCI 1100 or 1214 and its lab.

Degree Requirements
A candidate for the Master of Science degree concentration in Applied Statistics must complete a minimum of 33 semester hours of graduate work approved by the department Graduate Committee including:

Core Requirements (24 semester hours)
   - STAT 5123 Applied Statistics I (3)
   - STAT 5124 Applied Statistics II (3)
   - STAT 5126 Theory of Statistics I (3)
   - STAT 5127 Theory of Statistics II (3)
   - STAT 7027 Topics in Statistics (3)
   - STAT 7127 Linear Statistical Models (3)
   - STAT7133 Multivariate Analysis (3)
   - MATH 7691 Research Seminar (1-3)

Electives (9 semester hours)
1) Two course selected from among:
   - CSCI 5131 Computer Simulation (3)
   - STAT 7027 Topics in Statistics (3)
   - MATH 5128 Applied Probability I (3)
   - MATH 5129 Applied Probability II (3)
   - MATH 5143 Analysis I (3)
   - MATH 5165 Numerical Linear Algebra (3)
   - MATH 7120 Probability Theory I (3)
   - MATH 7121 Probability Theory II (3)
   - MATH 7143 Real Analysis I (3)
   - MATH 7692 Research Seminar (3)
   - OPRS 5111 Linear Programming (3)
   - OPRS 5112 Non-linear Programming (3)
   - OPRS5113 Game Theory (3)
   - OPRS 5114 Dynamic Programming (3)
2) Any MATH/STAT/OPRS course at the 7000 level.

Students who, because of their undergraduate work or other experience, can demonstrate sufficient knowledge of the material in one or more of the core courses may be exempted from taking the course or courses. Exemption from a course carries no credit towards the degree concentration.
Research Seminar and Thesis Option (3 semester hours)

All candidates for the Master of Science degree concentration in Applied Statistics are required to complete 3 hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application of techniques identified in the literature or studied in other courses. All projects are subject to the prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

A student may choose to expand the work begun in MATH 7691 (Research Seminar) into a Master's Thesis by registering for 3 hours of MATH 7893 (Thesis) to fulfill the elective requirement under (2) above. This thesis option affords the student the opportunity to do professional and scholarly work demonstrating proficiency in the area of applied statistics.

Comprehensive Examination

Each candidate for the Master of Science degree concentration in Applied Statistics must perform satisfactorily on an oral comprehensive examination over the candidate's program of study.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. degree program in Applied Mathematics is designed to enable its students to master a significant body of mathematics, including a specialty in applied mathematics; to relate this knowledge to a coherent area of science or engineering, and to carry on fundamental research in applied mathematics at a nationally competitive level. The recipient of this degree will, according to his or her abilities and choice of sub-specialty, be able to work effectively in a research and development environment involving mathematical or statistical analysis and modeling in business, government or industry; to teach mathematics at the college or university level; or to carry on fundamental research in his or her area of specialty.

Additional Admission Requirements

In addition to the requirements of the Graduate School for admission to doctoral study, applicants must have completed at least 27 hours of courses in the mathematical sciences at the undergraduate level, as approved by the department Graduate Committee, with grades of C or better. Admission requires that the candidate be able to take Real Analysis 8143 or be able to take MATH 5143 and have other factors in their record that indicates strong potential to complete the program. For prospective students who have done work in mathematics beyond the bachelor's degree, performance on that work will be considered in admissions decisions. Candidates for admission must make satisfactory scores on the general portion of the Graduate Record Examination (GRE).

Students are admitted to the program by the Graduate School, based on the recommendation of the department Graduate Committee or its designate, the Graduate Program Coordinator. Recommendations are based on the Committee’s judgement of the candidate’s ability to complete the program, as supported by the application materials. The department may waive certain requirements if it judges the candidate to be nonetheless capable of completing the program. If there are more candidates than can be accommodated, candidates are admitted in order of perceived mathematical ability, promise of success, and suitability to the program.

Degree Requirements

Program of Study

The student must complete an approved program of study, including a minor, typically including approximately 54 credit hours. The minor is interdisciplinary and may be satisfied by 9 hours of graduate work outside the mathematics department, by 6 credit hours for a project in an area of application, or by a combination of external coursework and directed project in an area of application totaling 9 credit hours.

Each student will have an advisory committee appointed by the department Graduate Committee in consultation with the student and approved by the Department Chair. It includes the prospective dissertation adviser as chair, or co-chair, if the dissertation adviser is not a member of the Department of Mathematics. The advisory committee should be appointed as soon as is feasible, typically within a year after passing the Preliminary Examination. Once formed, it will have the responsibility of constructing and approving the program of study which includes the minor. Prior to the appointment of the advisory committee the student will be advised by a graduate faculty member appointed by the department Graduate Committee.

Grades

A student is expected to achieve A's or B's in all courses included in the program of study and must have at least a 3.0 GPA to graduate. The dissertation is graded on a pass/unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the program. If a student makes a grade of U on any course, enrollment will be terminated and the student cannot take further graduate work without being readmitted to the program.
Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the department Graduate Committee.

Transfer Credit
Only courses with grades of A or B may be accepted for transfer credit. Transfer credit must be approved by the department Graduate Committee, and cannot exceed the limit set by the Graduate School.

Preliminary Examination
The student is expected to take the preliminary examination within three semesters of being admitted to the Ph.D. program. The examination consists of two parts: a written examination based on Real Analysis I and II (8143-8144) and a written examination based on two other related courses chosen by the student and approved by the department Graduate Committee. The student must pass both examinations in a single attempt in order to pass the preliminary examination. At the discretion of the department Graduate Committee, the student may be allowed to retake the preliminary examination a second time if the student does not pass on the first attempt. A student who fails the preliminary examination twice is disenrolled from the Ph.D. program.

Qualifying Examination and Admission to Candidacy
Each student must pass a comprehensive oral examination covering her/his chosen field of research and related advanced course work. The exam is conducted by the student's Advisory Committee and may include an additional written examination. The exam is open to the graduate faculty of the department. The student is expected to take the qualifying examination within two years of the appointment of the student's Advisory Committee. A student who fails the qualifying examination twice is disenrolled from the Ph.D. program. The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School.

Dissertation
The student must complete and defend a dissertation based on a research program approved by the student's dissertation adviser which results in a high quality, original and substantial piece of research. The student must orally present and successfully defend the dissertation before the student's Advisory Committee in a defense that is open to the public. A copy of the dissertation must be made available to the graduate faculty of the department at least two weeks prior to the public defense. The dissertation will be graded on a pass/no credit basis by the Advisory Committee and must be approved by the Department Chair and the Dean of the Graduate School.

Residency Requirement
The full-time Ph.D. student must enroll for one continuous full-time year (i.e. two consecutive semesters of at least nine graduate credit hours in each semester) following admission to the program.

Language and Research Tool Requirements
Each student must demonstrate a reading knowledge of French, German or Russian by passing a written translation exam in one of these languages conducted by the Mathematics Department. In addition, the student must demonstrate significant computer expertise applicable to research or teaching in his or her major field as approved by the student's Advisory Committee. The computer expertise requirement may include course work or work on a project and may overlap with the minor requirement.

Time Limit for Degree Completion
The student must achieve admission to candidacy within six years after admission to the program and complete all requirements within six years after admission to candidacy for the Ph.D. degree. All requirements for the degree must be completed within eight years after first registration as a doctoral student.

MATHEMATICS EDUCATION
Master of Arts Degree
Program of Study
The Master of Arts in Mathematics Education degree program is designed primarily for secondary mathematics school teachers interested in professional growth and graduate certification in mathematics teaching. Emphasis in this program is given to developing depth and breadth in mathematics teaching and learning, appropriate to the role of the secondary school teacher.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Mathematics Education:
1) Twenty-seven hours of undergraduate coursework in Mathematics beyond the freshman level, or evidence of equivalent academic preparation.
2) Possession of a North Carolina "A" teacher's license or the equivalent from another state. An applicant may be admitted on the condition that he/she satisfies the Class "A" requirements early in his/her course of study. Work applied to the Class "A" deficiency may not be applied toward the degree.
3) Two years of full-time experience teaching mathematics in a secondary school or other acceptable teaching experience.
A satisfactory score is required on the Aptitude Portion of the Graduate Record Examination.

Degree Requirements
The Master of Arts in Mathematics Education degree requires successful completion of a minimum of 36 semester hours of graduate credit or the equivalent. Of these, 18 hours must be in courses numbered 6000 or above. Programs of study beyond these 36 hours may be required to remove deficiencies in undergraduate programs or to develop areas of need, interest, or desired experience.

Core Courses
Each candidate must complete:
18 hours of graduate-level Mathematics courses selected in consultation with the program Coordinator, with at least 9 hours of courses at the 6000-level. A recommended plan of study includes:
- MATH 6100 Foundations of Mathematics (3)
- MATH 6101 Foundations of Real Analysis (3)
- MATH 6102 Calculus from an Advanced Viewpoint (3)
- MATH 6106 Modern Algebra (3)
- MATH 6107 Linear Algebra (3)
- MATH 6118 Non-Euclidean Geometry (3)

12 hours of graduate-level courses covering mathematics education learning theory, research, and contemporary topics in secondary mathematics teaching. These courses include:
- MAED 6120 Research in Mathematics Education (3)
- MAED 6122 Theoretical Foundations of Learning Mathematics (3)
- MAED 6124 Issues in the Teaching of Secondary School Mathematics (3)
- RSCH 6101 Educational Research Methods (3)

3) 6 hours of graduate-level professional education courses including:
- MDSK 6260 Principles of Teacher Leadership (3)

An additional three hours of graduate-level Mathematics, Mathematics Education, or Education courses selected in consultation with the student's adviser.

4) A Basic Portfolio consisting of documents and artifacts that provides evidence of the student's professional growth during the program. By the end of his/her first semester in the program, each student will select a member of the Mathematics Education faculty who will serve as his/her Graduate Advisor throughout the program.

Approval of the program of each student and provision of advice regarding progress toward the degree are the responsibility of the Graduate Advisor.

Comprehensive Exam
Upon successful completion of all coursework, each candidate for the degree in Mathematics Education must pass a comprehensive final exam consisting of two parts. The student must pass an oral exam on the mathematics content courses. The second part of the exam involves the student presenting documentation that demonstrates their professional growth as teachers and educational researchers. The student has the option of presenting either a research-based project or a comprehensive portfolio. The Graduate Advisor will advise and assist the student in planning his/her Comprehensive Portfolio or Final Research Report.

COURSES IN MATHEMATICS, MATHEMATICS EDUCATION AND STATISTICS

Mathematics
MATH 5000. Topics in Foundations or History of Mathematics. (2-3) Prerequisite: consent of the department. Topics in the foundations or the history of mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (On demand)

MATH 5040. Topics in Analysis. (2-3) Prerequisite: consent of the department. Topics in the foundations or the history of mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (On demand)

MATH 5060. Topics in Algebra. (2-3) Prerequisite: consent of the department. Topics in algebra selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (On demand)

MATH 5080. Topics in Geometry and Topology. (3) Prerequisite: consent of the department. Topics in geometry or topology selected as to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (On demand)

MATH 5109. History of Mathematical Thought. (3) Prerequisite: MATH 1241 or consent of the department. A study of the development of mathematics in its historical setting from the earliest beginnings to modern times. Not approved for the M.A. in mathematics degree. (Fall) (Evenings)

MATH 5128. Applied Probability I. (3) Prerequisite: MATH/STAT 3122 and MATH 2171 or consent of the department. Finite and countable Markov chains, Markov Decision Processes, and optimal stopping. Other topics
selected from: queuing theory, inventory models, reliability theory, game theory, recurrent events, information theory, stochastic control, stochastic control with incomplete information and Kalman filtering.

MATH 5129 Applied Probability II. (3) Prerequisite: MATH 5128 or consent of the department. Continuation of MATH 5128. (Spring) (Alternate years)

MATH 5143. Analysis I. (3) Prerequisite: MATH 3141 with a grade of B or better, or consent of the department. First course of a two-semester sequence providing a rigorous treatment of continuity, differentiability and integration of functions of one and several real variables. (Fall)

MATH 5144. Analysis II. (3) Prerequisite: MATH 5143 with a grade of B or better or consent of the department. Continuation of MATH 5143. (Spring)

MATH 5161. Number Theory. (3) Prerequisite: MATH 3163 with a grade of C or better or consent of the department. A study of the elements of classical number theory including divisibility, congruences, diophantine equations, prime numbers and their distribution, quadratic reciprocity, number-theoretic functions, and famous unsolved problems. Not approved for the M.A. in mathematics degree. (Spring) (Alternate years)

MATH 5163. Modern Algebra. (3) Prerequisite: MATH 3163 or consent of the department. Groups, rings, integral domains, fields. (Fall) (Alternate years)

MATH 5164. Abstract Linear Algebra. (3) Prerequisite: MATH 3163 and 2164 or consent of the department. Vector spaces over arbitrary fields, linear transformations, canonical forms, multilinear algebra. (Spring) (Alternate years)

MATH 5165. Numerical Linear Algebra. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2164 and 2171, all with a grade of C or better, or consent of the Department. Gaussian elimination and LU decomposition methods for linear systems. Vector and matrix norms, condition numbers and accuracy of solutions. Solutions of large sparse matrix systems using skyline solvers, and Jacobi, Gauss-Seidel, and SOR iterative methods. Solution of nonlinear systems. Least squares methods using the QR factorization. Selected problems will be programmed for computer solution. (Fall) (Alternate years)

MATH 5171. Numerical Solution of Ordinary Differential Equations. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of C or better, or consent of the Department. Numerical solution techniques for ordinary differential equations such as Runge-kutta, multistep and extrapolation methods. Stiff solvers and stability criteria. Comparative work with modern robust codes and visualization methods. (On demand)

MATH 5172. The Finite Element Method. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of C or better, or consent of the department. Boundary value problems and their variational form. Finite element basis functions, computational techniques, isoparametric elements and curved boundaries, alternate methods, singular problems, eigenvalue problems. Some practical experience with an F.E.M. program and graphical output. (Spring) (Alternate years)

MATH 5173. Ordinary Differential Equations. (3) Prerequisites: MATH 2171 and MATH 3142, or consent of the department. Existence and uniqueness theorems for initial value problems; continuous dependence of solutions on initial values and right hand sides; linear differential equations in R2 and Rn; non-linear differential equations in R2 and Rn: phase portraits, singularities, cycles; invariant manifolds; linearization; singularities of planar systems; Lyapunov stability; examples: van der Pol oscillator, Liénard systems, Volterra-Lotka equations. (Spring)

MATH 5174. Partial Differential Equations. (3) Prerequisites: MATH 2164 and MATH 3141, or consent of the department. Classification of types of partial differential equations. Separation of variables, Sturm-Liouville problems, boundary and eigenvalue problems, fundamental solutions and Green's theorem, Fourier series and integrals, Laplace transforms. (Fall)

MATH 5176. Numerical Methods for Partial Differential Equations. (3) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171 all with a grade of C or better, or consent of the department. Basic finite difference schemes for the solutions of elliptic, parabolic and hyperbolic equations. Van Neuman analysis, characteristics, boundary conditions. (Fall) (Alternate years)

MATH 5181. Introduction to Topology. (3) Prerequisite: MATH 2164 with a grade of C or better. Topics from set theory and point set topology such as cardinality, order, topological spaces, metric spaces, separation axioms, compactness and connectedness. (Fall) (Alternate years)

MATH 5691. Seminar. (1-6) Prerequisite: consent of the department. Individual or group investigation and exposition of selected topics in mathematics. (On demand)

MATH 5692. Seminar. (1-6) Prerequisite: consent of the department. A continuation of MATH 5691. (On demand)

MATH 6004. Topics in Analysis. (3) Prerequisite: MATH 6101 or consent of department. Topics in analysis
selected so as to complement regular course offerings in this area of mathematics. May be repeated for credit with the consent of department. (On demand)

MATH 6008. Topics in Geometry and Topology. (3) Prerequisite: consent of department. Topics selected from Euclidean geometry, non-Euclidean geometry, projective geometry, differential geometry, point-set topology, algebraic topology. May be repeated for credit with approval of department. (On demand)

MATH 6100. Foundations of Mathematics. (3) Prerequisite: consent of department. Logic, sets and axiomatic systems. (Fall, Summer) (Alternate years)

MATH 6101. Foundations of Real Analysis. (3) Prerequisite: MATH 6100 or consent of department. Axiomatic and historical development of the real and complex numbers; rigorous development of limits and continuity of functions, intermediate and extreme value theorems. (Fall) (Alternate years)

MATH 6102. Calculus from an Advanced Viewpoint. (3) Prerequisite: MATH 6101 or its equivalent. A continuation of MATH 6101. A rigorous approach to differentiation and integration of functions of one real variable. (Spring) (Alternate years)

MATH 6103. Computer Techniques and Numerical Methods. (3) Prerequisite: MATH 6101 or consent of department. Computer systems, programming, and the computer solution of numerical problems. (Summer) (Alternate years)

MATH 6105. Problem Solving in Discrete Mathematics. (3) Prerequisite: consent of department. Propositional and predicate calculus, counting techniques, partially ordered sets, lattices, graphs and trees. (Alternate years)

MATH 6106. Modern Algebra. (3) Prerequisite: MATH 3163 or its equivalent or consent of department. Topics chosen from group theory, rings and ideals, integral domains, fields and elementary Galois theory. (Summer) (Alternate years)

MATH 6107. Linear Algebra. (3) Prerequisite: MATH 2164 or its equivalent or consent of department. Systems of linear equations, matrices, vector spaces, linear transformations, determinants, canonical forms of matrices, inner products. (Summer) (Alternate years)

MATH 6108. Non-Euclidean Geometry. (3) Prerequisite: consent of department. History of Euclid’s Fifth Postulate and attempts to prove it; work of Gauss, Bolyai, Lobachevsky and others; systematic development of hyperbolic geometry; relative consistency of hyperbolic geometry; relative consistency of hyperbolic and Euclidean geometries. (Alternate years)

MATH 6171. Advanced Applied Mathematics I. (3) Prerequisites: MATH 2241 and 2171 with grades of C or better, or consent of department. Power series solutions of ordinary differential equations, vector calculus, line and surface integrals, partial differential equations and Fourier integrals. (Fall) (Evenings)

MATH 6172. Advanced Applied Mathematics II. (3) Prerequisites: MATH 2241 and 2171 with grades of C or better or consent of department. Complex analysis; probability and statistics. (Spring) (Evenings)

MATH 6609. Seminar. (1-3) Prerequisite: consent of the department. A series of regularly scheduled meetings in which each student will present one or more topics selected by the instructor. May be repeated for credit with the consent of the department. (On demand)

MATH 7028. Topics in Probability. (3) Prerequisite: MATH 7120 and 7121, or consent of department. Topics of current interest in probability and advanced topics in probability. May be repeated for credit with the consent of the department. (On demand)

MATH 7070. Topics in Numerical Analysis. (3) Prerequisite: consent of the department. Topics of current interest in numerical analysis. May be repeated for credit as topics vary and with the approval of the department. (On demand)

MATH 7071. Topics in Differential Equations. (3) Prerequisite: consent of the department. Topics of current interest in ODE, PDE, dynamical systems, inverse problems and related subjects. May be repeated for credit with the consent of the department. (On demand)

MATH 7120. Probability Theory I. (3) Prerequisites: MATH 7143 and MATH/STAT 3122 or consent of department. Topics include probability spaces, probability measures, sigma-algebras, characteristic functions, sequences of random variables, law of large numbers, general forms of the Central Limit Theorem. (Fall) (Alternate years)

MATH 7121. Probability Theory II. (3) Prerequisite: MATH 7120 or consent of the department. A continuation of MATH 7120. (Spring) (Alternate years)
MATH 7125. Stochastic Processes I. (3) Prerequisites: MATH 3122 and 7143 or consent of the department. Basic ideas in the study of stochastic processes, selected from: discrete and continuous time Markov processes, stationary and renewal processes, applications to queueing theory, reliability theory, stochastic differential equations, time-series analysis, filtering and stochastic control theory. (On demand)

MATH 7126. Stochastic Processes II. (3) Prerequisite: MATH 7125. A continuation of MATH 7125. (On demand)

MATH 7141. Complex Analysis I. (3) Prerequisite: MATH 5143 or consent of the department. Holomorphic functions, complex integration, residues, entire and meromorphic functions, conformal mapping, harmonic functions. (Spring) (Alternate years)

MATH 7142. Complex Analysis II. (3) Prerequisite: MATH 7141. A continuation of MATH 7141. (On demand)

MATH 7143. Real Analysis I. (3) Prerequisite: MATH 5144 or consent of the department. Lebesgue integration on the real line, Lp spaces, introduction to general measure and integration theory. (Fall)

MATH 7144. Real Analysis II. (3) Prerequisite: MATH 7143 or consent of the department. A continuation of MATH 7143. (Spring)

MATH 7147. Applied Functional Analysis. (3) Prerequisite: MATH 5144. Introduction to functional analysis and its applications to such areas as linear and non-linear differential equations, integral equations, and control theory. Topics chosen from Banach spaces, operators, the Hahn-Banach, open mapping and closed graph theorems, Sobolev spaces, spectral theory, operators in Hilbert space. (Summer) (On Demand)

MATH 7148. Functional Analysis. (3) Prerequisite: MATH 7144 or consent of the department. Material selected from: spectral theory, spectral theory of differential operators, groups and semigroups of operators, nonlinear functional analysis, asymptotic analysis, integral equations, Fourier analysis, distributions, and Sobolev spaces. (Fall) (Alternate years)

MATH 7163. Modern Algebra I. (3) Prerequisite: MATH 4163 and 4164 or consent of department. Topics will be selected from: Galois theory, commutative algebra, modules, ring theory, homological algebra. (Fall) (Alternate years)

MATH 7164. Modern Algebra II. (3) Prerequisite: MATH 7163. A continuation of MATH 7163. (On demand)

MATH 7172. Partial Differential Equations. (3) Prerequisite: MATH 5174 and 7144 or consent of department. Harmonic functions, mean-value theorem, maximum principle, Green’s representation for the solution of the Dirichlet problem for Laplace’s equation; Poisson’s equations and the Poisson formula; statement and proof of the existence theorem for general second-order elliptic operators, generalized maximum principles; Sobolev spaces. Evolution equations involving elliptic operators, such as the heat or wave equations, may also be introduced. (Spring) (Alternate years)

MATH 7173. Evolution Equations. (3) Prerequisite: MATH 7144 and 7172 or consent of the department. Semigroups of operators and their generators, examples of semigroups. The heat equation, examples of elliptic operators that generate semigroups, Hille-Yosida theory, analytic semigroups; examples, fractional powers of operators. (On demand)

MATH 7174. Linear and Non-linear Waves. (3) Prerequisite: MATH 5124 and 7144 or consent of the department. Hyperbolic waves, characteristics, Riemann invariants, conservation laws, weak solutions, shock structure. Burger's equation, gas dynamics, dispersive waves, group velocity, water waves, non-linear optics. (On demand)

MATH 7175. Inverse Problems. (3) Prerequisite: MATH 7144 and 7174 or consent of the department. Ill-posed problems and numerical methods for them. Applications of inverse problems to real processes. One dimensional inverse problems. Multi-dimensional inverse problems: uniqueness and numerical methods. Inverse scattering problems. (On demand)

MATH 7176. Advanced Numerical Analysis. (3) Prerequisites: MATH 2164, 2171 and 5176 or consent of the department. A selection of topics from such areas as iterative methods of solving linear and non-linear systems of equations, approximation theory, splines, and finite element methods for partial differential equations. (Spring) (Alternate years)

MATH 7177. Applied Optimal Control. (3) Prerequisites: MATH 5143 or consent of the department. Examples of control systems and optimization problems, optimal control of discrete-time systems, solutions of the general discrete-time optimization problem, optimal control of continuous-time systems, the calculus of variations, solution of the general continuous optimization problem, applications of the Pontryagin Maximum Principle, Dynamic programming, and Bang-bang control. Controllability and differential games may also be introduced. (Spring) (Alternate years)

MATH 7178. Computational Methods for Fluid Dynamics. (3) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2242, 2171, 5174 and 5176 or consent of the department. Topics on various numerical techniques
for the solution of incompressible and compressible
flows. Finite difference, finite element and spectral
methods, and shock capturing and fitting methods. Multi-
grid method and acceleration techniques. (On demand)

(3) Prerequisite: consent of the department. Accuracy
analysis and design of high order schemes, stability theory
of schemes with variable coefficients, stability theory of
schemes for initial-boundary value problems,
convergence theory for nonlinear cases. (On demand)

MATH 7181. Topology I. (3) Prerequisite: consent of
department. Topological spaces, continuous functions,
connectedness, compactness, and metrizability, and
further topics from point-set, geometric or algebraic
topology. (On demand)

MATH 7182. Topology II. (3) Prerequisite: MATH
7181. A continuation of MATH 7181. (On demand)

MATH 7184. Differential Geometry I. (3) Prerequisite:
consent of the department. Manifolds, differential
structures, tangent bundles, embeddings, immersions,
inverse function theorem, Morse-Sard theorem,
transversality, Borsuk-Ulam theorem, vector bundles,
Euler characteristics, Morse theory, Stokes theorem,
Gauss-Bonnet theorem, Whitney embedding theorem.
(On demand)

MATH 7185. Differential Geometry II. (3)
Prerequisite: consent of the department. Differentiable
manifolds, differential forms, critical points, local and
global theory of curves, local and global theory of
surfaces, connections, geodesics, curvature, spaces of
constant curvature, Lie groups and Lie algebras. (On
demand)

MATH 7273. Advanced Finite Element Analysis. (3)
Prerequisite: MATH 5172 and 5174 or consent of the
department. Selection of topics from such areas of finite
element analysis as convergence theorems (Ciarlet),
hierarchical basis functions, the h-p method, adaptive grid
techniques and solution methods for nonlinear equations.
(Fall/Alternate years)

MATH 7275. Dynamical Systems I. (3) Prerequisites:
MATH 5143 and MATH 5173 or consent of the
department. Cycles and separatrices cycles, Poincaré first-
return map: diffeomorphisms, Poincaré-Bendixson
Theory, flows on the two-torus; structural stability,
genericity, Peixoto's theorem; singularities of planar
systems. Degenerate singularities, Hopf bifurcation,
saddle-node bifurcation, center bifurcation. (On demand)

MATH 7276. Dynamical Systems II. (3) Prerequisite:
MATH 7275 or consent of the department. Method of
averaging, Melnikov functions, hyperbolic structure,
symbolic dynamics, homoclinic and heteroclinic orbits,
global bifurcations, infinite dimensional dynamical
systems, inertial manifolds, Lyapunov exponents and
dimension of attractors, codimension-two bifurcations,
Duffing's equation, Lorenz equations, finite dimensional
systems of dimension at least three. (On demand)

MATH 7277. Bifurcation Theory. (3) Prerequisite:
MATH 7275 or consent of the department. Implicit
function theorem, manifolds and transversality, Newton
polygons, Lyapunov center theorem, variational methods,
Ljusternik-Schnirelman theory, mountain-pass theorem,
bifurcations with one-dimensional null-spaces, Morse
theory and global bifurcations, geometric theory of partial
differential equations. (On demand)

MATH 7691. Research Seminar. (1-3) Prerequisite:
consent of department. A seminar in which independent
study may be pursued by the student or a group of
students under the direction of a professor. (On demand)

MATH 7692. Research Seminar. (1-3) Prerequisite:
consent of department. A continuation of MATH 7691.
(On demand)

MATH 7893. Thesis. (1-3) Prerequisite: consent of
department. Subject to the approval of the department
Graduate Committee, the thesis may be original work,
work of an expository nature, or the mathematical
formulation and solution of a particular industrial or
business problem suggested by the career interests of the
student. The thesis must be defended in an oral
presentation. May be repeated for credit with the consent
of department. (Fall, Spring, Summer)

MATH 8028. Topics in Probability. (3) See MATH
7028 for Course Description.

MATH 8050. Topics in Mathematics. (2-3) See
MATH 7050 for Course Description.

MATH 8065. Topics in Applied Algebra and
Algebraic Structures. (3) See MATH 7065 for Course
Description.

MATH 8070. Topics in Numerical Analysis. (3) See
MATH 7070 for Course Description.

MATH 8071. Topics in Differential Equations. (3)
See MATH 7071 for Course Description.

MATH 8120. Probability Theory I. (3) See MATH
7120 for Course Description.

MATH 8121. Probability Theory II. (3) See MATH
7121 for Course Description.

MATH 8125. Stochastic Processes I. (3) See MATH
7125 for Course Description.

MATH 8126. Stochastic Processes II. (3) See MATH
7126 for Course Description.
MATH 8141. Complex Analysis I. (3) See MATH 7141 for Course Description.

MATH 8142. Complex Analysis II. (3) See MATH 7142 for Course Description.

MATH 8143. Real Analysis I. (3) See MATH 7143 for Course Description.

MATH 8144. Real Analysis II. (3) See MATH 7147 for Course Description.

MATH 8147. Applied Functional Analysis. (3) See MATH 7147 for Course Description.

MATH 8148. Functional Analysis. (3) See MATH 7148 for Course Description.

MATH 8163. Modern Algebra I. (3) See MATH 7163 for Course Description.

MATH 8164. Modern Algebra II. (3) See MATH 7164 for Course Description.

MATH 8172. Partial Differential Equations. (3) See MATH 7172 for Course Description.

MATH 8173. Evolution Equations. (3) See MATH 7173 for Course Description.

MATH 8174. Linear and Non-linear Waves. (3) See MATH 7174 for Course Description.

MATH 8175. Inverse Problems. (3) See MATH 7175 for Course Description.

MATH 8176. Advanced Numerical Analysis. (3) See MATH 7176 for Course Description.

MATH 8177. Applied Optimal Control. (3) See MATH 7177 for Course Description.

MATH 8178. Computational Methods for Fluid Dynamics. (3) See MATH 7178 for Course Description.

MATH 8181. Topology I. (3) See MATH 7181 for Course Description.

MATH 8182. Topology II. (3) See MATH 7182 for Course Description.

MATH 8184. Differential Geometry I. (3) See MATH 7184 for Course Description.

MATH 8185. Differential Geometry II. (3) See MATH 7185 for Course Description.

MATH 8273. Advanced Finite Element Analysis. (3) See MATH 7273 for Course Description.

MATH 8275. Dynamical Systems I. (3) See MATH 7276 for Course Description.

MATH 8276. Dynamical Systems II. (3) See MATH 7276 for Course Description.

MATH 8277. Bifurcation Theory. (3) See MATH 7277 for Course Description.

MATH 8691. Research Seminar. (1-3) See MATH 7691 for Course Description.

MATH 8692. Research Seminar. (1-3) See MATH 7692 for Course Description.

MATH 8994. Doctoral Research and Reading. (1-9) Prerequisite: consent of the department. May be repeated with consent of the department. (On demand)

Mathematics Education
MAED 5000. Topics in Mathematics Education, Early Childhood. (1-6) Prerequisite: consent of department. (On demand)

MAED 5040. Topics in Mathematics Education, Intermediate. (1-6) Prerequisite: consent of department. (On demand)

MAED 5070. Topics in Mathematics Education, Secondary. (1-6) Prerequisite: consent of department. (On demand)

MAED 5101. Arithmetic in the School. (3) Prerequisite: MATH 1100 or equivalent. A study of the number systems with emphasis placed upon the basic concepts and meanings, properties of addition, multiplication, inverses, systems of numeration and number line appropriate for each grade. (Does not count toward a major in mathematics. Open only to transfer students who have completed six semester hours of mathematics at another university.) (On demand)

MAED 5104. Microcomputing for Teachers. (3) Prerequisites: working knowledge of college algebra and trigonometry, and consent of department. Introduction to basic computer concepts, to microcomputer systems, to the design and development of programs to assist instruction in mathematics and computer sciences. A programming language such as BASIC or LOGO will be used. Each student will integrate skills learned by selecting, designing and developing a specific project. (No prior experience with computer programming required.) (Spring) (Evenings)

MAED 5105. Geometry for Teachers. (3) Prerequisite: MATH 2102 or MAED 5101 or consent of department. A study of the foundations of Euclidean geometry and a brief treatment of non-Euclidean geometry. Emphasis on learning activities and teaching techniques for teachers of mathematics K-12. (Spring) (Evenings)
MAED 5141. Mathematics for the Intermediate School Teacher. (3) Prerequisite: MATH 2102 or consent of department. A study of the algebraic properties of the real numbers; functions, equations, inequalities and their graphs, activities and applications related to upper elementary and intermediate grades. (Fall) (Evenings)

MAED 6120. Research in Mathematics Education. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. An introduction and overview of research in the teaching and learning of mathematics in K-12. Overview of contemporary research perspectives and paradigms; interpreting and synthesizing the research literature; survey of contemporary research problems in mathematics teaching and learning; development of classroom-based research studies. (Alternate years)

MAED 6122. Theoretical Foundations of Learning Mathematics. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. Introductions to theories of learning that have influenced the teaching of mathematics in K-12. An overview of theories that have guided reforms in mathematics teaching; contemporary constructivist theories of mathematics learning. (Alternate years)

MAED 6124. Issues in the Teaching of Secondary School Mathematics. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. Study of major issues affecting secondary mathematics education: analysis of the impact of learning theories on methods of teaching; assessment methods for improving mathematics learning; analysis of the historical and programmatic development of the secondary school mathematics curriculum leading to current trends, issues, and problems; and analysis of the role of technology in the secondary mathematics classroom. (Alternate years)

Statistics
STAT 5123. Applied Statistics I. (3) Prerequisites: MATH 2164 with a grade of C or better and junior standing, or consent of department. Review of stochastic variables and probability distributions, methods of estimating a parameter, hypothesis testing, confidence intervals, contingency tables. Linear and multiple regression, time series analysis. (Fall) (Evenings) (Alternate years)

STAT 5124. Applied Statistics II. (3) Prerequisite: STAT 5123 or consent of the department. Single factor analysis of variance. Multi-factor analysis of variance. Randomized complete-block designs, nested or hierarchical designs, Latin squares, factorial experiments. Design of experiments. (Spring) (Evenings) (Alternate years)

STAT 5126. Theory of Statistics I. (3) Prerequisite: STAT 3123 or consent of the department. Survey of the mathematical structure supporting applied statistics. Discrete and continuous distributions, moment-generating functions, sampling, point estimation, the multivariate normal distribution, sampling distributions. (Fall) (Alternate years)

STAT 5127. Theory of Statistics II. (3) Prerequisite: STAT 5126 or consent of the department. Point and interval estimations, hypothesis testing, regression and linear hypotheses, experimental designs and analysis, distribution-free methods. (Spring) (Alternate years)

STAT 7027. Topics in Statistics. (3) Prerequisite: consent of the department. Topics of current interest in statistics and/or applied statistics. May be repeated for credit with consent of the department. (On demand)

STAT 7122. Advanced Statistics I. (3) Prerequisite: MATH 7143 and STAT 5127 or consent of department. A survey of frequently used statistical techniques selected from: estimation theory and hypothesis testing, parametric goodness-of-fit criterion and tests for independence, measures of association, regression techniques, multi-sample inferential techniques, Bayes and minimax estimation, admissibility, minimax property. (On demand)

STAT 7123. Advanced Statistics II. (3) Prerequisites: STAT 7122 or consent of the department. Hypothesis testing, Neyman-Pearson Lemma, UMP tests, UMP unbiased tests, monotone likelihood ratio families of distributions, UMP invariant tests. Confidence bounds and regions, uniformly most accurate bounds, regression models, least squares estimates, normal equations, Gauss-Markov theorem. Large sample behavior of methods of moments estimates, maximum likelihood estimates, likelihood ratio tests, Chi-square tests, approximate confidence regions for large samples. (On demand)

STAT 7124. Sampling Theory. (3) Prerequisite: STAT 5126 or consent of the department. Methods and theory of survey sampling: simple, systematic, stratified, cluster multistage and specialized sampling schemes and the problems of their implementation and analysis. (On demand)

STAT 7127. Linear Statistical Models. (3) Prerequisites: MATH 2164 and 3123 or consent of the department. A selection of topics from the following list: distribution and quadratic forms, regression, dummy variables, models not of full rank, the two-way crossed classification, time series. (Fall) (Alternate years)

STAT 7133. Multivariate Analysis. (3) Prerequisite: STAT 5126 and 5127 or consent of the department. Multivariate distributions. Inference for the multivariate normal model. Further topics from the following: principal components, factor analysis, multidimensional scaling, canonical correlation, discriminant analysis, cluster analysis, multivariate linear models, special topics. (Fall) (Alternate years)
STAT 8027. Topics in Statistics. (3) See STAT 7027 for Course Description.

STAT 8122. Advanced Statistics I. (3) See STAT 7122 for Course Description.

STAT 8123. Advanced Statistics II. (3) See STAT 7123 for Course Description.

STAT 8124. Sampling Theory. (3) See STAT 7124 for Course Description.

STAT 8127. Linear Statistical Models. (3) See STAT 7127 for Course Description.

STAT 8133. Multivariate Analysis. (3) See STAT 7133 for Course Description.

OPERATIONS RESEARCH

Department of Mathematics
376 Fretwell Building
704-687-4929

Degree
Interdisciplinary Graduate Minor

The interdisciplinary graduate minor in Operations Research is designed to provide advanced problem solving skills and knowledge in the general areas of operations research and optimization to enable their application to effectively address the present-day problems of business, management science, engineering and computer science. This program can serve as an effective and focused supplement to existing graduate programs in the participating departments. The required courses are offered by the participating departments of Electrical Engineering, Civil Engineering, Computer Science, Mechanical Engineering, Economics, and Information & Operations Management.

Admission Requirements
Students admitted to graduate degree programs in the participating departments and the M.B.A. program who are in good standing, are eligible for the minor in Operations Research.

Requirements for the Minor
1) Declaration of the minor, preferably by the end of the first semester of graduate study.
2) Formation of a Program Committee: Students who elect to minor in Operations Research will select a participating faculty member as a member of their regular graduate committee. A list of participating faculty will be available from the coordinator of the minor in Operations Research.
3) Fulfill the requirements of a participative degree program and complete OPRS 6101/8101 and one course each from two of the following areas selected with the advice and knowledge of the student’s program committee.

Mathematics: OPRS 5111, 5112, 5113, 5114 MATH 5165, 7125, 7177 and topics: reliability theory, queuing models, variational methods.

Computer Science: CSCI 5131, 5150, 6160, 6166 Management Information Systems and Operations Management: MBAD 6121, 6122, 6141

Economics: ECON 4100, 4112

Electrical Engineering: EEGR 6111, 6112, 6115, 6116

Civil Engineering: CEGR 5090, 6181

Students must have a cumulative 3.0 GPA in courses applied to the minor. Course waivers and transfer credit will be considered on an individual basis.

COURSES IN OPERATIONS RESEARCH

OPRS 5010. Topics in Decision Mathematics. (2-3) Prerequisite: consent of the department. Topics in decision mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for additional credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (On demand)

OPRS 5111. Linear Programming. (3) Prerequisite: OPRS 3111 and CSCI 1100 or 1201 and 1201L. Mathematical formulation and solution of linear programming problems. Topics include: the simplex method and its variations, sensitivity and parametric analysis, duality, and applications. A project will be required of all graduate students. (On demand)

OPRS 5112. Non-Linear Programming. (3) Prerequisites: CSCI 1100 or 1201 and 1201L. OPRS 3111 and MATH 2241. Basic unconstrained optimization problems, search techniques, some discussion of rates of convergence and an introduction to constrained optimization. Computer implementation and testing of optimization algorithms will be required. A project will be required of all graduate students. (On demand)

OPRS 5113. Game Theory. (3) Prerequisites: OPRS 3111 and one of STAT 2122, MATH/STAT 3122, or OPRS 3113. The theory of zero-sum matrix games, minimax theorem, optimal strategies, symmetric games, economic models, infinite, separable, polynomial, multi-stage, general-sum and n-person games. A project will be required of all graduate students. (On demand)

OPRS 5114. Dynamic Programming. (3) Prerequisites: CSCI 1100 or 1201 and its lab, OPRS 3111, and one of STAT 2122, MATH/STAT 3122 or OPRS 3113. The identification of dynamic programming problems and
their solution in terms of recurrence relations. Elementary path problems, resource allocation, shortest path, traveling salesmen problem, discrete-time optimal control, replacement models and inventory systems. A project will be required of all graduate students. (On demand)

**OPRS 6101. Introduction to Operations Research. (3)**

**OPRS 7125. Stochastic Processes. (3)** Same as MATH 7125.

**OPRS 8101. Introduction to Operations Research. (3)** See description for OPRS 6101.

**OPRS 8125. Stochastic Processes. (3)** Same as MATH 7125.

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**PHYSICS**

Department of Physics and Optical Sciences
101 Burson Building
704-547-2537
http://www.physics.uncc.edu

**Degrees**
M.S. (Applied Physics), Ph.D. (Interdisciplinary, ECE, ME, IT, Math and Biology)

**Coordinator**
Dr. M. Yasin Akhtar Raja

**MASTER OF SCIENCE**

The Master of Science program in Applied Physics offers both thesis and non-thesis degree options. While students have opportunities for research in optics, astronomy, plasma physics, and nuclear magnetic resonance, the research emphasis in the Department is in the area of applied optics. Primary areas of optics research include: optoelectronic devices and systems; optical sensing and measurement; adaptive optics; nanoscale imaging and spectroscopy; nano- and micro-structured photonic materials, quantum optical phenomena in photonic crystals and resonant media, fiber and integrated optics; optical metrology; photonics, optical communications (components and networks), and lasers and optical amplifiers; and biomedical optics. A description of the physics research areas can be obtained by viewing home page at http://www.physics.uncc.edu.

**Additional Admission Requirements**
In addition to fulfilling the university’s general requirements for graduate admission at the Master’s level, applicants seeking admission into the physics graduate program must also:
1) Possess a Bachelor’s degree in Physics, or a closely allied field, usually from an accredited college or university. Applicants from fields other than Physics may expect to be required to take pre-requisites in order to gain background in fundamental physics.
2) Present satisfactory scores on the aptitude portion of the Graduate Record Examination.
3) Possess an overall grade point average of at least 2.75 (based on a 4.0 scale) on all of the applicant’s previous work beyond high school. The average in the major should be 3.0 or better.
4) Demonstrate evidence of sufficient interest, ability, and preparation in physics to adequately profit from graduate study, as determined by the Physics Department’s Graduate Committee.

**Admission to Candidacy**
In addition to the general requirements for admission to candidacy, students enrolled in the Master of Science program in Applied Physics program should have:
1) Removed all identified entrance deficiencies by the time of application for admission to candidacy,
2) Completed at least 18 approved credit hours with a GPA of 3.0 or better, and
3) Passed the qualifying examination administered by the student’s advisory committee. Normally, the qualifying examination for a student selecting the thesis option will be based on a literature search related to the thesis topic.

**Degree Requirements**
The Master of Science degree in Applied Physics requires the completion of 30 hours of course work (thesis hours included) approved by the Physics Department and may include up to 12 semester hours from such related areas as Mathematics, Chemistry, Engineering, and Biology. A candidate for the degree must present credit for PHYS 4222, PHYS 4232, PHYS 4242, and a minimum of 15 semester hours in courses numbered 6000 and above. Students not presenting credit for PHYS 4222, PHYS 4232, and PHYS 4242 respectively at the time of admission are required to take PHYS 5222, PHYS 5232, and PHYS 5242 respectively during their first year of
residence. Courses for which undergraduate credit has been awarded may not be repeated for graduate credit. A student selecting the thesis option must present credit for at least 6 semester hours of PHYS 6991.

A minimum grade point average of 3.0 is required on all course work attempted for the degree. At the time of admission up to 6 semester hours of graduate transfer credit may be accepted if approved by the Physics Department and the Graduate School.

Comprehensive Examination
All candidates for the degree must pass a final examination. The thesis defense is the final examination for those students who select the thesis option.

Assistantships
Support for beginning graduate students is usually a teaching assistantship. Continuing students are often supported by research assistantships.

INTERDISCIPLINARY PH.D. OPTIONS

The Physics Department, in conjunction with the Departments of Electrical Engineering, Mechanical Engineering, Biology, and the School of Information Technology, offers an opportunity for students who have completed a program leading to the Master of Science degree with a research emphasis in applied optics to continue graduate studies leading to a Ph.D. Students choosing those areas of applied optics related to optoelectronics would receive the Ph.D. through the Electrical Engineering Department; those working in those areas of applied optics related to precision engineering or materials engineering would receive a Ph.D. in Mechanical Engineering. Students pursuing biomedical optics and physics would enroll through the Biology Department. Students selecting an interdisciplinary Ph.D. option would pursue a course of study that includes work in both the Physics Department and one of the participating departments. The interdisciplinary Ph.D. options with Electrical Engineering, Mechanical Engineering, and Biology are described below. Students interested in the information technology Ph.D. program should contact the graduate coordinator for the latest information.

Ph.D. Option in Optoelectronics, Precision Metrology, or Materials Engineering

In preparation for the Ph.D. qualifying examination, students selecting either the optoelectronics or microelectronics option should take PHYS 4271 or EEGR 4125, EEGR 4133, and PHYS 4231 or EEGR 3122 during their first year as a student in the Master of Science in Applied Physics Program. During their second year students in either of these options should take EEGR 5165, PHYS 6271 or EEGR 5137, and PHYS 6211. For this same reason students selecting either the precision engineering or materials engineering option should take MEGR 2144, MEGR 2180, MEGR 3116, and MEGR 3221.

The following is the chronologically ordered set of requirements for the interdisciplinary Ph.D. option in either Electrical Engineering or Mechanical Engineering. These requirements begin upon completion of requirements for the Master of Science Degree.

1) Appointment of a Ph.D. Advisor and formation of an advisory committee.
2) Development of a plan of study detailing all course examination requirements.
3) Successful completion of the written qualifying examination.
4) Presentation of a proposal for Ph.D. research and admission to candidacy.
5) Successful defense of the Ph.D. dissertation.

Ph.D. Option in Biomedical Optics

The interdisciplinary program leading to the Ph.D. degree in Biology has a strong applied research orientation and has as its intellectual focus a synthesis of the molecular and integrative bases of biomedical sciences and related biotechnology. The program draws upon the strengths of faculty in multiple departments and is intended to serve students with interests in conducting research in the hospital setting, industry, and academia. The program’s area of concentration represents a field where a strong national need is emerging.

In addition to a strong research requirement, the program in biomedical sciences and bio-technology will emphasize a solid background of relevant and multi-disciplinary course work. Admission to the program will require a degree in biology, chemistry, physics, engineering, or a related field. Students entering the program will be expected to remedy any course work deficiencies identified by the biology interdisciplinary doctoral committee at the beginning of their program and to conduct research intended to lead to publication in appropriate and internationally recognized journals. The amount of course work required for the program will depend on the background of the student and will be established by the biology interdisciplinary doctoral committee and the student’s advisory committee. All students will take a series of core courses that will stress the interdisciplinary nature of the program. These courses will expose students to current issues in the chemical, physical, and engineering aspects of biotechnology and to the ethical implications of biomedical and biotechnological research.

The cornerstone of the proposed program is the research dissertation which is to be an independent research study resulting in an original and significant contribution that will lead to publication of journal articles in national/international peer-refereed journals.
COURSES IN PHYSICS

Any physics course at the 5000 or 6000 level except PHYS 5231 can be applied to the 30-hour requirement. Any other courses to be applied toward the 30-hour-course requirement must be approved, in advance, by the Physics Department. Courses approved by the Physics Department as appropriate for meeting the 30-hour-degree requirement are listed below. A minimum of 15 credit hours must be in courses with a 6000 number.

Intermediate Graduate Courses

PHYS 5000. Selected Topics in Physics. (1-4)
Prerequisite: Consent of Department. Advanced special topics. May be repeated with approval of the Department. (On demand)

PHYS 5210. Theoretical Physics. (3) Topics include: Matrices, power series, solutions to ordinary and partial differential equations, Hilbert space, Fourier integrals, boundary value problems, Green’s functions, and complex analysis. (Fall)

PHYS 5220. Classical Mechanics II. (3) Prerequisite: PHYS 3121 and MATH 2241. Continuation of PHYS 3121. The second course of a two-semester sequence treating particle dynamics, the motion of systems of particles, rigid body motion, moving coordinate systems, Lagrange’s equations, Hamilton’s equations, and small oscillations. (Spring)

PHYS 5231. Electromagnetic Theory I. (3) Prerequisites: For physics majors, PHYS 3121 with a grade of C or better; Others: consent of instructor; MATH 2171, MATH 2241. Corequisite: MATH 2242. The first course of a two-semester sequence. Topics considered include electrostatics and magnetostatics in free space and in matter, the motion of charged particles in electric and magnetic fields, capacitance, dielectric theory, field energy, electromagnetic induction and inductance, vector and scalar potentials, magnetic properties of matter, Maxwell’s equations, solutions of Maxwell’s equations in free space and in matter, propagating electromagnetic waves, and boundary value problems. (Spring)

PHYS 5232. Electromagnetic Theory II. (3) Prerequisite: PHYS 4231. Continuation of PHYS 4231. The second course in a two-semester sequence. Topics include magnetostatics in free space and in matter, electromagnetic induction, vector and scalar potentials, magnetic properties of materials, Maxwell’s equations in free space and in matter, propagating electromagnetic waves, and boundary value problems. (Fall)

PHYS 5242. Modern Physics II. (3) Prerequisite: PHYS 4241. An extension of PHYS 4241 to include more advanced topics such as generalized eigenvalue problems, angular momentum, spin, the hydrogen atom, and perturbation theory, with selected applications from atomic, solid state, and nuclear physics. (Spring)

PHYS 5271. Principles of Geometrical and Physical Optics. (3) Prerequisites: PHYS 2102 with a grade of C or better, senior standing, and MATH 2171. Exceptions by consent of the instructor. Topics include the mathematics of wave motion, light as an example of an electromagnetic wave, the superposition of periodic and non-periodic waves, and selected topics from geometrical and physical optics. (Fall)

Advanced Graduate Courses

PHYS 6101. Biophysics. (3) Prerequisite: Consent of instructor. Will include principles of physics relevant to biological media; electrical activity, optical microscopy, and spectrophotometry. Photosynthesis and light absorption. Models of blood flow and the cardiovascular system. Dynamics of membrane lipids and ionic flow. Visual and audio systems. Radiation biophysics, ultrasonic interaction in biological media. Credit cannot be awarded for both PHYS 6101 and 8101. (Fall)


PHYS 6141. Quantum Theory I. (3) Prerequisite: PHYS 6131. Non-relativistic wave mechanics. The Schrodinger equation, linear harmonic oscillator and WKB approximation. Central forces and angular momentum. The hydrogen atom. (Spring, alternate years)

PHYS 6142. Quantum Theory II. (3) Prerequisite: PHYS 6141. Scattering theory, linear vector spaces, spin, two level systems. Quantum dynamics, symmetry operations, bound state and time-dependent perturbation theory. Theory of scattering, angular momentum, and identical particles. (On demand)
PHYS 6201. Fourier Optics. (3) Prerequisite: PHYS 4271 or consent of instructor. Principles of scalar, Fresnel, and Fraunhofer diffraction theory. Coherent optical imaging systems, optical filtering, optical data processing, and holography. Application of Fourier optics and holography. (Spring)

PHYS 6211. Introduction to Modern Optics. (3) Prerequisite: PHYS 4271 or consent of department. Theory of laser oscillation, optical resonators, interaction of radiation and atomic systems, giant pulsed lasers, laser systems. Wave propagation in non-linear media, modulation of optical radiation, noise in optical detection and generation. Interaction of light and sound. Laser types and applications including the free-electron laser. (Spring)

PHYS 6220. Computational Methods in Physics. (3) Prerequisite: PHYS 5210. Use of computers in solving physics problems including computational and mathematical methods to solve problems in classical mechanics, quantum mechanics, electromagnetism, nuclear physics, optics, and solid state physics. Computer solutions include numerical methods of integration, solving differential equations, curve fitting, and statistical analysis in physics. (On demand)

OPTI 6221 Optical Communications I. (3) Prerequisite: Prerequisites: PHYS 4242, 6241, or ECEGR 5165. Introduction to optical communications. Optical waveguides (attenuation, dispersions, etc.). Basic communication blocks such as lasers, optical modulators, and optical transceivers. Passive and active photonic components such as tunable lasers, optical amplifiers, SOAs, λ-converters, and filters. Coherent and incoherent detection. Signal processing, photonic switching, and point-to-point connections. Three lecture hours per week. (Spring)

PHYS 6241. Light Sources and Detectors. (3) Prerequisite: PHYS 4241 or consent of department. Wave nature of light, basic semiconductor properties, light sources, light detectors and modulators, optical waveguides, optical systems with applications, and selected topics in non-linear optics. (Fall)

PHYS 6251. Statistical Physics. (3) Prerequisite: Consent of instructor. Classical and quantum statistical mechanics. Statistical thermodynamics. Ensembles, partition functions, fluctuations, ideal Fermi and Bose gas systems. (On demand)

PHYS 6261. Nuclear and Particle Physics. (3) Prerequisite: Consent of instructor. Properties of nuclei, nuclear models, and interactions. Nuclear reactions, fission, and fusion. Alpha, beta, and gamma decay. One and two particle states. Relativistic kinematics, principle of invariance, quantum numbers, elementary particles and models. (On demand)


PHYS 6281. Modern Optics Laboratory. (3) Prerequisite: PHYS 3281 or consent of instructor. Selected experiments in such modern optics areas as fiber optics, holography, spectroscopy, and Fourier optics. Six laboratory hours each week. (Spring)

PHYS 6991. Physics Thesis Research I. (1-3) Prerequisite: admission to candidacy and consent of instructor. Research for the thesis. Letter grade assigned. May be repeated to accumulate a maximum of 6 hours credit. (Fall, Spring, Summer)

PHYS 6992. Physics Thesis Research II. (1-4) Prerequisite: PHYS 6991 and consent of instructor. Research for the thesis. Graded pass/no-credit. May be repeated to accumulate a maximum of 4 hours credit. (Fall, Spring, Summer)

PHYS 7999. Graduate Residence (1) Required of all masters students who are working on or defending thesis projects, and/or are scheduled for comprehensive examinations, but who are not enrolled in other graduate courses. Credit for this course may not be used to satisfy the 30-semester hour requirement for the degree. May be repeated for credit. (Fall, Spring, Summer)

PHYS 8101. Biophysics. (3) See PHYS 6101 for Course Description.

PHYS 8121. Classical Dynamics. (3) See PHYS 6121 for Course Description.

PHYS 8131. Classical Electromagnetism I. (3) See PHYS 6131 for Course Description.

PHYS 8132. Classical Electromagnetism II. (3) See PHYS 6132 for Course Description.

PHYS 8141. Quantum Theory I. (3) See PHYS 6141 for Course Description.

PHYS 8142. Quantum Theory II. (3) See PHYS 6142 for Course Description.

PHYS 8201. Fourier Optics. (3) See PHYS 6201 for Course Description.

PHYS 8211. Introduction to Modern Optics. (3) See PHYS 6211 for Course Description.
PHYS 8221. Optical Communications I. (3) See PHYS 6221 for Course Description.

PHYS 8241. Light Sources and Detectors. (3) See PHYS 6241 for Course Description.

PHYS 8251. Statistical Physics. (3) See PHYS 6251 for Course Description.

PHYS 8261. Nuclear and Particle Physics. (3) See PHYS 6261 for Course Description.

PHYS 8271. Advanced Solid State Physics. (3) See PHYS 6271 for Course Description.

PHYS 8999. Doctoral Degree Residence. (1-8)
Contact the Department for more information.

PHYS 9999. Doctoral Residence. (1) Required of all doctoral students working on or defending their dissertation who are not enrolled in other graduate courses. Credit for this course may not be used to satisfy requirement for the degree. May be repeated for credit. (Fall, Spring, Summer)

PSYCHOLOGY

Department of Psychology
4018 Colvard Building
704-687-4731

Degree
M.A.

Coordinator
Dr. W. Scott Terry

Graduate Faculty

Clinical/Community Psychology
Lawrence G. Calhoun, Professor
James R. Cook, Associate Professor
C. D. (Denny) Fernald, Associate Professor
Ryan Kilmer, Assistant Professor
Albert A. Maisto, Bonnie Cone Distinguished Professor
Richard D. McAnulty, Associate Professor
Sam Simono, Professor
Richard Tedeschi, Professor

Industrial/Organizational
Kimberly K. Buch, Associate Professor
David C. Gilmore, Associate Professor
Jo Ann Lee, Associate Professor
William D. Siegfried, Associate Professor

Other members of the Graduate Faculty
Arnie Cann, Professor
Paul W. Foos, Professor
Jane F. Gaultney, Associate Professor
Paula Goolkasian, Professor
Douglas L. Grimsley, Professor
Andrew Harver, Professor
Susan K. Johnson, Assistant Professor
David Sohn, Associate Professor
Debra F. Terrell, Assistant Professor
W. Scott Terry, Professor
Ignatius J. Toner, Professor
Lori Van Wallendael, Associate Professor

MASTER OF ARTS
Clinical/Community Psychology

The objective of the master’s degree program in Clinical/Community Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in modern living. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

Students develop knowledge and skills in psychological assessment, learn various treatment and intervention strategies, and work with a variety of populations in consultation, evaluation, and research. An extensive practicum component utilizes the Charlotte area as a setting for applied experience.

The program prepares students for the North Carolina psychology licensure exam and for positions in diverse settings such as community mental health centers, correctional facilities, and other human service programs. A number of graduates have gone on to pursue a doctoral degree.

Additional Admission Requirements
To be considered for admission to graduate study in Clinical/Community Psychology, a student must present the following requirements in addition to those required by the Graduate School:
1) Completed application by March 1
2) 18 hours of undergraduate psychology including Introductory Psychology & Research Methods
3) An undergraduate course in statistics
4) Acceptable scores on the Verbal and Quantitative GRE
5) The GRE subject test in psychology is strongly recommended

Admission to the program is very competitive for the spaces available each year. Most students who are admitted have much better records than the minimum
required. The primary Clinical/Community Psychology application deadline is March 1 for admission in the fall semester, but if space is still available, late applications will be considered until May 1. Students may not begin the program during the spring semester.

### Degree Requirements
The Clinical/Community Psychology program requires at least 48 semester hours of graduate coursework. Full-time students should be able to complete the program in two calendar years. A thesis and comprehensive exam are required.

#### Basic Knowledge and Methods in Psychology (14 hours)
- **PSYC 6102** Research Design and Quantitative Methods in Psychology (3)
- **PSYC 6107** Ethical and Professional Issues in Psychology (3)
- **PSYC 6999** Thesis (3)

And two courses (6 hours) selected from the following:
- **PSYC 6010** Topics in Learning and Cognition (3)
- **PSYC 6015** Topics in Perception and Physiological Psychology (3)
- **PSYC 6020** Topics in Developmental Psychology (3)
- **PSYC 6030** Topics in Social Psychology and Personality (3)

#### Clinical/Community Coursework (34 hours)
- **PSYC 6050** Topics in Psychological Treatment (3)
- **PSYC 6141** Intellectual Assessment (4)
- **PSYC 6142** Personality Assessment (4)
- **PSYC 6145** Applied Research Design and Program Evaluation (3)
- **PSYC 6150** Psychological Treatment (4)
- **PSYC 6151** Behavior Disorders (4)
- **PSYC 6155** Community Psychology (3)
- **PSYC 6450** Practicum in Clinical Psychology (3)
- **PSYC 6455** Practicum in Community Psychology (3)

Or a second

- **PSYC 6450** Practicum in Clinical Psychology (3)
- Elective (Selected in consultation with adviser) (3)

Hours beyond the 48 hours may be required by the academic adviser and the Clinical/Community Program Committee. The faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who are not developing good applied skills in the practice of psychology, who fail to complete coursework in a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or practicum work, or may be removed from the program. The enrollment of a student who receives three grades of C or one Unsatisfactory grade during his or her graduate career is automatically terminated.

### Comprehensive Examinations
All students are required to successfully complete comprehensive examinations covering research design, ethics and knowledge of clinical/community psychology. Students who fail the comprehensive exam twice are removed from the program.

### Assistantships
A variety of resources are available for financial assistance. These include teaching assistantships to proctor the general psychology laboratory, research assistantships from faculty grants, and graduate assistantships in other campus units such as the Learning Center and Disability Student Services. These range in pay from $8,000 to $12,000 per academic year.

### Research Experiences
Students are encouraged to become involved in ongoing research in the department, and they are required to complete a thesis.

### Practica
Practica, involving practical experience working with human service agencies in the region, are a required part of the program.

#### MASTER OF ARTS

**Industrial/Organizational Psychology**

The objective of the master’s degree program in Industrial/Organizational Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in work organizations. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. Students in the Industrial/Organizational concentration develop knowledge and skills pertaining to people at work, including personnel selection, and the design and evaluation of programs, including programs for training employees, increasing performance, enhancing quality, reducing conflict and enhancing job satisfaction. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

### Additional Admission Requirements
To be considered for admission to graduate study in Industrial/Organizational Psychology, a student must present the following requirements in addition to those required by the Graduate School:

1) Completed application by February 1
2) 18 hours of undergraduate psychology including Introductory Psychology & Research Methods
3) An undergraduate course in statistics
4) Acceptable scores on the Verbal and Quantitative GRE.
5) The GRE subject test in psychology is strongly recommended.

These are minimum standards. Admission to the Industrial/Organizational program is very competitive for the spaces available each year. The primary application deadline is February 1 for admission in the fall semester, but if space is available, late applications will be considered until May 1. Students may not begin the program during the spring semester.

**DEGREE REQUIREMENTS**

The Industrial/Organizational program requires at least 48 semester hours of graduate coursework as specified below. Full-time students should be able to complete the program in two calendar years.

**Basic Knowledge and Methods in Psychology (14 hours)**

- PSYC 6102 Research Design and Quantitative Methods in Psychology (3)
- PSYC 6107 Ethical and Professional Issues in Psychology (3)
- PSYC 6999 Thesis (3)

And two courses (6 hours) selected from the following:

- PSYC 6010 Topics in Learning and Cognition (3)
- PSYC 6015 Topics in Perception and Physiological Psychology (3)
- PSYC 6020 Topics in Developmental Psychology (3)
- PSYC 6030 Topics in Social Psychology and Personality (3)

**Industrial/Organizational Psychology (22 hours)**

- PSYC 6140 Psychological Measurement and Evaluation (3)
- PSYC 6171 Industrial/Organizational Psychology (3)
- PSYC 6171L Laboratory in I/O Psychology (1)
- PSYC 6172 Personnel I (3)
- PSYC 6174 Organizational Dynamics I (3)
- PSYC 6175 Organizational Dynamics II (3)
- PSYC 6177 Personnel II (3)
- PSYC 6477 Projects in I/O Psychology (3)

**Electives selected in consultation with Adviser (12 hours)**

- PSYC 6124 Psychology of Aging (3)
- PSYC 6176 Counseling in Organizations (3)
- PSYC 6899 Readings and Research (3)

Graduate courses from other disciplines

The faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who fail to complete coursework on a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or may be removed from the program. The enrollment of a student who receives three grades of C or one Unsatisfactory grade during his or her graduate career is automatically terminated.

**Comprehensive Examinations**

All students are required to successfully complete comprehensive examinations covering research design, ethics and information related to Industrial/Organizational Psychology. A student who fails the comprehensive exam twice will be removed from the program.

**Assistantships and Other Financial Assistance**

A variety of resources are available for financial assistance. These include teaching assistantships to proctor the general psychology laboratory, research assistantships to assist on faculty grants, and graduate assistantships in psychology and other campus units such as the Learning Assistance Center and the University Honors Office. These range from $8,000 to $12,000 per academic year. Information on loans, grants and employment opportunities is available from the Financial Aid Office.

**Research Experiences**

In addition to the completion of a thesis, students have the opportunity to work with individual faculty members on their research. The Department of Psychology has an energetic and dynamic faculty of more than 30 psychologists who are committed to education and have established an excellent record or productivity in all the major areas of psychological research and professional practice.

**Practica**

An extensive practicum component utilizes the Charlotte area as a setting for applied experience. All students must complete 3 hours of Projects in I/O Psychology (PSYC 6477) and they are strongly encouraged to take 6 hours.

**COURSES IN PSYCHOLOGY**

**PSYC 6010 Topics in Learning and Cognition. (3)** An examination of selected topics in the areas of learning, memory and cognition, and behavior modification, with an emphasis on the applications to the areas of clinical, community and industrial psychology. May be repeated for credit with the permission of department. (*Alternate years*)

**PSYC 6015. Topics in Perception and Physiological Psychology. (3)** An examination of selected topics in the areas of sensation and perception, physiological and neuropsychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. (*Alternate years*)
PSYC 6020. Topics in Developmental Psychology. (3) An examination of selected topics in child and adult development, aging, and developmental disabilities, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. (Alternate years)

PSYC 6030. Topics in Social Psychology and Personality. (3) An examination of selected topics in personality and social psychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. (Alternate years)

PSYC 6050. Topics in Psychological Treatment. (3) Prerequisite: PSYC 6151. A topical course which will focus on issues in treatment, alternative treatment perspectives, special client populations. May be repeated for credit with departmental permission. (Yearly)

PSYC 6099. Topics in Psychology. (3) A discussion of selected topics in psychology. (On demand)

PSYC 6102. Research Design and Quantitative Methods in Psychology. (3) Prerequisites: MATH 1222 and PSYC 2102 or equivalent. Experimental and correlational methods of psychological research, including single subject designs with emphasis on research design and the application of statistical methods to psychological research. (Fall)

PSYC 6107. Ethical and Professional Issues in Psychology. (2) Roles and responsibilities of psychologists, including ethical standards in professional practice, testing and research; expectations and problems confronting psychologists in industrial, clinical and professional organizations. (Fall)

PSYC 6111. Psychology of Learning and Memory. (3) Principles, theories and current research in learning with emphasis on human learning and memory. (On demand)

PSYC 6112. Applied Behavior Analysis. (3) Use of behavior principles in applied settings. Topics include: behavioral assessment, positive and negative reinforcement, punishment, extinction, stimulus control, maintenance and generalization of behavior change. Each student will design and carry out a behavior change project. (On demand)

PSYC 6113. Physiological Psychology. (3) The relationships between the nervous system and behavior. Topics include the structure of the nervous system and nerve conduction, the functional organization of the central nervous system, neuronal and hormonal control of behavior, biofeedback and other appropriate topics. (On demand)

PSYC 6115. Sensation and Perception. (3) Processes involved in receiving and interpreting sensory data including all the sensory systems with an emphasis on vision. (On demand)

PSYC 6120. Developmental Psychology. (3) Psychological development across the lifespan. (On demand)

PSYC 6124. Psychology of Aging. (3) Psychology of aging with particular emphasis on issues related to community/clinical psychology and industrial/organizational psychology. Topics include myths and stereotypes about aging, problems faced by older workers, retirement, mental health and normal aging, counseling the older adult, and psychological disorders in later life. (Spring)

PSYC 6130. Social Psychology. (3) Human social behavior; topics include affiliation, person perception, conformity and attitudes. (On demand)

PSYC 6135. Psychology of Personality. (3) A critical evaluation of major personality theories including an extensive survey of current research. (On demand)

PSYC 6140. Psychological Measurement and Evaluation. (3) Prerequisite: PSYC 6102. Measurement of psychological characteristics; scaling, reliability, validity and norms; construction and use of the intelligence tests, personality inventories, interest tests, attitude scales, etc., interviewing, survey techniques and behavioral assessment. (Spring)

PSYC 6141. Intellectual Assessment. (4) Theories of intelligence and methods of intellectual assessment, including practice in administering intelligence tests, interpreting results, and writing evaluation reports. Three lecture hours and one two-hour lab per week. (Fall)

PSYC 6142. Personality Assessment. (4) Prerequisite: PSYC 6151, 6141 or permission of department. Theories and methods used in the assessment of personality and psychopathology, including practice in administering personality tests, interpreting results and writing evaluation reports. Three lecture hours and one two-hour lab per week. (Spring)

PSYC 6145. Applied Research Design and Program Evaluation. (3) Prerequisite: PSYC 6102. Models of evaluative research; also techniques, designs and administration of program evaluation. Topics include role conflicts, entry issues, goal setting, research for program planning and implementation and examples of actual program design and evaluation. (Spring)

PSYC 6150. Introduction to Psychological Treatment. (4) Prerequisite: PSYC 6151. Major approaches to psychological intervention, including psychodynamic, behavioral, humanistic and cognitive-
behavioral systems. Emphasis on practical therapy considerations, including crisis intervention, client behaviors at various stages of therapy, handling difficult clients and ethical and professional issues. Three lecture hours and one two-hour lab per week. (Spring)

**PSYC 6151. Behavior Disorders. (4)** Diagnostic systems in current use and the implications of these systems for psychologists; several perspectives on psychological processes, behavior disorders and diagnosis including psychodynamic, behavioral and social models; practice in diagnostic interviewing. Three lecture hours and one two-hour lab per week. (Fall)

**PSYC 6153. Classification of Psychological Dysfunctions. (3)** Introduction to systems for classifying psychological disorders for counselors and review of current theoretical, experimental, and clinical perspectives on abnormal psychology, including the current Diagnostic and Statistical Manual of Mental Disorders. Credit will not be given for both PSYC 6153 and PSYC 6151. (Spring)

**PSYC 6155. Community Psychology. (3)** Research, intervention techniques and settings associated with major approaches in community psychology including the mental health, organizational, ecological and social action models. (Fall)

**PSYC 6171. Industrial/Organizational Psychology. (3)** Human behavior within organizations. Topics include personnel selection and placement, job analysis, motivation, satisfaction, consumer psychology and ergonomics. (Fall)

**PSYC 6171L. Laboratory in Industrial/Organizational Psychology. (1)** Corequisite: PSYC 6171. Practice in administration and scoring of surveys and tests. Experience in role plays, training practices, and interviews. (Fall)

**PSYC 6172. Personnel I. (3)** Prerequisite or corequisite: PSYC 6171, 6140. Techniques of applied personnel psychology. Topics include job analysis, testing in industry, interviews, personality measures, assessment centers, job evaluation, and polygraphs. (Spring)

**PSYC 6173. Individual Dynamics. (3)** The individual within the organization. Special emphasis on theories of motivation and job satisfaction. (On demand)

**PSYC 6174. Organizational Dynamics I. (3)** Prerequisite: PSYC 6171. Group processes, including group formation, group decision making, leadership and group structure. (Spring)

**PSYC 6175. Organizational Dynamics II. (3)** Prerequisite: PSYC 6174. Organization theories and organizational change methods. (Fall)

**PSYC 6176. Counseling Psychology in Organizations. (3)** Application of psychology to special problems within the organization, especially the counseling of employees experiencing life problems: for example, retirement, alcoholism, interpersonal conflict. (On demand)

**PSYC 6177. Personnel II. (3)** Prerequisite: PSYC 6172. Theoretical bases of personnel psychology. Topics include performance appraisal, legal issues, personnel strategies, validation issues, utility analysis, human resource planning and training. (Fall)

**PSYC 6200. Health Psychology. (3)** Intensive review of the contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, and the improvement of the health care system. The course will examine links between psychology and health by emphasizing interactions among biological, behavioral and social systems that impact health and illness experiences. Topics will include stress, coping, pain, chronic disease and psychoneuroimmunology. Emphasizes the relevance of age, gender, personality, and culture for understanding health related behaviors. (Fall)

**PSYC 6202. Methods in Health Psychology. (3)** Prerequisite: PSYC 6102 and PSYC 6200. Advanced review of qualitative and quantitative issues relevant to the conduct of health and behavior research. Topics include assessment of quality of life; instrument sensitivity, specificity, and responsiveness; and, the evaluation of health service delivery. Emphasizes the development of methodological, analytical, and interpretive skills necessary to evaluate practices, programs, and policies in health psychology. (Spring)

**PSYC 6213. Physiological Foundations of Health Psychology. (3)** Prerequisite: PSYC 6200. Biological theories and models will be introduced and applied to health issues. Topics may include addiction, mental illness, neuropsychology, and psychophysiology. Emphasizes the relation between the nervous system and behavior for understanding health and illness. (Fall)

**PSYC 6230. Applications of Social Psychology to Health Psychology. (3)** Prerequisite: PSYC 6200. Social psychology theories and models will be introduced and applied to health issues. Topics may include the role of social perception processes in understanding and adjusting to illness, social influence strategies and promoting health-maintaining behaviors, self-efficacy and coping, and other factors related to health maintenance or recovery. (Spring)

**PSYC 6260. Topics in Health Psychology. (3)** Prerequisite: PSYC 6200. An examination of selected topics in Health Psychology. May be repeated for credit with departmental approval. (On demand)
PSYC 6261. Independent Study in Health Psychology. (1-3) Prerequisite SYC 6200. Directed individual study of an issue in health psychology arranged with a faculty member. May be repeated for credit. (Fall, Spring, Summer)

PSYC 6262. Internship in Health Psychology. (1-3) Prerequisite: PSYC 6200 and permission of the department. Experience in assessment and treatment with clients at local health agencies under supervision from a faculty member on campus. Applications of the principles of health psychology to special problems with in a health care organization or setting. May be repeated for credit with departmental approval. (Fall, Spring, Summer)

PSYC 6450. Practicum in Clinical Psychology. (1-3) Prerequisites: PSYC 6150 and permission of department. Experience in clinical assessment and/or psychotherapy with clients at local agencies under supervision from a faculty member on campus. May be repeated for credit with departmental approval. (Fall, Spring, Summer)

PSYC 6455. Practicum in Community Psychology. (1-3) Applications of the principles of community psychology to special problems within an organization or community setting. The project might include, but would not be limited to, consultation, program development, training, community education or program evaluation. May be repeated for credit with departmental approval. (Fall, Spring, Summer)

PSYC 6477. Projects in Industrial/Organizational Psychology. (1-3) Prerequisite: PSYC 6171. A structured practicum experience or research paper in industrial/organizational psychology. May be repeated for credit with departmental approval. (Fall, Spring, Summer)

PSYC 6899. Readings and Research in Psychology. (1-4) Prerequisite: permission of instructor and department to be obtained in the semester preceding the semester in which the course is to be taken. Individual study in psychology which may take the form of conducting empirical research or formulating a critique and synthesis of existing research. May be repeated for credit. (Fall, Spring, Summer)

PSYC 6999. Thesis. (1-3) The thesis is coordinated with the student’s interests and practical experience during the second year to allow the development of an area of specialization. Thesis projects can be of three types: an original experiment that will contribute to the psychological literature; a thorough case analysis including literature review and application; the development of a community psychology program or intervention to accomplish an important, well-defined goal. A completed paper and oral presentation are required. May be repeated for credit with departmental approval. (Fall, Spring, Summer)

PUBLIC ADMINISTRATION

Department of Political Science
440 Fretwell Building
704-547-2577
http://www.uncc.edu/polisci/mpahandbook.html

Degree
M.P.A.

Coordinator
Dr. Gary R. Rassel

Graduate Faculty
A. Hunter Bacot, Associate Professor
Dana B. Bradley, Assistant Professor
William P. Brandon, Metrolina Medical Foundation Distinguished Professor of Health Policy
Gary Johnson, Assistant Professor
Suzanne Leland, Assistant Professor
Gary R. Rassel, Associate Professor
Marc Wallace, Assistant Professor

Program of Study
The primary objective of the Master of Public Administration (M.P.A.) Degree program is to provide professional training in public administration. The curriculum emphasizes the analysis of the political and administrative environments as well as the administrative decision-making approaches of public administration. Application of techniques and administrative skills to the management of nonprofit organizations is also included in the curriculum. The methods of instruction employed in the program expose students to a variety of approaches to public management.

Students may enroll in the Master of Public Administration program on either a full-time or part-time basis. The majority of classes are scheduled in the evening throughout the year. However, some classes are scheduled on Saturdays and during the afternoon. Classes meet on the main campus and at UNC Charlotte Uptown Center.

Additional Admission Requirements
 Admission to the Master of Public Administration program is open to qualified graduates of recognized colleges and universities accredited by a regional or general accrediting agency. There are seven major requirements for admission:
1) Application in writing submitted to the Graduate Admissions Office, accompanied by the application fee, which is neither deductible nor refundable.
2) Possession of a bachelor’s degree, or its equivalent, from an accredited college or university.
3) An acceptable undergraduate record with an overall minimum GPA of 3.0
4) An appropriate score on the aptitude portion of the Graduate Record Examination (GRE) or Miller Analogies Test (MAT).
5) A statement of professional career goals and a description of any significant work experience.
6) Three supporting letters of recommendation from professors or employers.
7) Submission of two official transcripts from all postsecondary educational institutions in which the candidate was enrolled. Applicants not meeting the minimum GPA or advanced test scores may be considered for conditional admission.

Prerequisite Requirements
In addition to the admission requirements, MPA students must complete the following prior to taking comprehensive exams: POLS 1110, Introduction to American Government (or the equivalent); STAT 1222, Elementary Statistics for the Social Sciences (or the equivalent); and demonstrate proficiency in computer applications.

Degree Requirements
The Master of Public Administration program is structured into three distinct phases: 1 - core, 2 - advanced work, and 3 - directed study or research project. In all, the program requires 40 hours of graduate credit for completion of the degree.

1) Core
All students are required to complete 22 hours in core areas as defined by the program. The emphasis in the core is twofold: (a) Achieving an overall perspective on the problems of public administration, and (b) Comprehending the various managerial and analytical approaches salient to the environment of public administration. After completing the core requirements each student must successfully complete a comprehensive examination covering the core courses. The core courses are:

MPAD 6102 Legal and Institutional Foundations of Public Administration (3)
MPAD 6104 Theoretical and Ethical Foundations of Public Administration (3)
MPAD 6125 Quantitative Research Methods in Public Administration (3)
MPAD 6125L Computer Laboratory in Quantitative Research Methods (1)
MPAD 6128 Public Policy Analysis and Program Evaluation (3)
MPAD 6131 Public Budgeting and Finance (3)
MPAD 6134 Human Resources Management (3)
MPAD 6160 Information Systems in Public Administration (3)

2) Advanced Courses
a) Electives: The MPA program offers several advanced elective courses in areas important to public administrators including application of analytic tools and understanding of public administration processes. With the approval of the Coordinator, students may take advanced elective work with other departments. Students are required to take a minimum of nine hours of advanced electives. The MPA electives are:
MPAD 6000 Topics for Graduate Study in Public Administration (1-4)
MPAD 6140 Labor Management Relations in Government (3)
MPAD 6141 Conflict Management in Public Organizations (3)
MPAD 6142 Managing Grants and Contracts in the Public & Nonprofit Sectors (3)
MPAD 6144 Changing the Public Organization (3)
MPAD 6160 Information Systems in Public Administration (3)
MPAD 6170 Communication Law and Policy (3)
MPAD 6172 Administration of Health Care Systems in the U.S. (3)
MPAD 6174 Public Policy and Politics in Health Care Administration (3)
MPAD 6176 Trends and Issues in Health Care Administration (3)
MPAD 6185 Intergovernmental Relations (3)
MPAD 6210 Aging and Public Policy (3)
MPAD 6211 Administration of Aging Programs (3)
MPAD 6310 Foundations of the Nonprofit Sector (3)
MPAD 6311 Introduction to Nonprofit Management (3)
MPAD 6320 Strategic Planning for Nonprofit Organizations (1)
MPAD 6321 Resource Development in Nonprofit Organizations (1)
MPAD 6322 Volunteer Management (1)
MPAD 6323 Grant Writing (1)
MPAD 6324 Financial Analysis for Government and Nonprofit Organizations (3)
MPAD 6325 Legal Aspects of Nonprofit Organizations (1)
MPAD 6820 Independent Study (1-3)

b) Capstone Seminar: Students are required to complete MPAD 6187: Advanced Seminar in Public Management Problem Solving as a capstone course after completing the comprehensive examination.

3) Directed Study or Research Applications (each MPA student must complete one of the options “a” or “b” for 6 credits)

a) Directed Study: Students who select this option will complete a written project on a topic of significance based on a field experience or research in public administration or nonprofit management. The Directed Study requires the following courses, graded on a pass/fail basis:
MPAD 6800 Directed Study in Public Administration (Proposal) (3)
MPAD 6801 Directed Study in Public Administration (Completed Study) (3)
University regulations governing the preparation and submission of Master’s theses apply to the Directed Study.

b) Research Applications: Students who select this option will complete a one-semester written project on an approved topic of significance in public administration or nonprofit management. The project will include the submission of revised paper drafts based on instructor evaluation. Students must enroll in the following course which is graded A, B, C, or U:
MPAD 6188 Research Applications in Public Administration (3)

Students who select this option must also take one additional elective course for 3 credits to complete the 40 hours required for the MPA degree.

Admission to Candidacy Requirements
Students are required to complete an “Application to Candidacy” form no later than the early part of the semester they wish to graduate. This form lists all courses to be counted toward the degree. It must be signed by the student and returned to the MPA Program office.

Assistantships
The department offers a number of graduate assistantships each academic year. To apply for an assistantship students must submit a completed “Application for Graduate Assistantship” form and a copy of their resume to the MPA Coordinator. Graduate assistantships are also available in several administrative units on campus.

Internships
Each student in the Master of Public Administration Program is required to complete a field experience. This requirement may be satisfied in one of these ways: (1) through a full-time position in a public or nonprofit organization; (2) through a full-time position in a business where the work experience is approved for internship; or (3) through an approved internship in a public or nonprofit organization. Each student must complete an “MPA Internship Information” form and submit it to the MPA office for approval. Forms to evaluate the internship experience must also be completed.

Track Descriptions
Currently the MPA Program has a concentration in the Management of Nonprofit Organizations. This concentration requires completion of the core MPA courses and MPAD 6187. The nonprofit concentration consists of 15 credit hours within the MPA curriculum. MPAD 6310, Foundations of the Nonprofit Sector; MPAD 6311, Introduction to Nonprofit Management; and MPAD 6188, Research Applications, each for three credits, are required. The focus of the paper in MPAD 6188 must be an approved topic in the nonprofit field. An additional 6 credit hours from the following courses are also required:

- MPAD 6142 Grant and Contract Management in the Public and Nonprofit Sectors (3)
- MPAD 6320 Strategic Planning for Nonprofit Organizations (1)
- MPAD 6321 Resource Development in Nonprofit Organizations (1)
- MPAD 6322 Volunteer Management (1)
- MPAD 6323 Grant Writing (1)
- MPAD 6324 Financial Analysis for Government and Nonprofit Organizations (3)
- MPAD 6325 Legal Aspects of Nonprofit Organizations (1)

Students may petition to take courses from other departments as well.

Capstone Experiences
Students are required to complete the following capstone course after successfully completing the comprehensive examination: MPAD 6187, Advanced Seminar in Public Management Problem Solving.

Advising
Each student is assigned an advisor and given a copy of the MPA Program Handbook when admitted to the program. The advisor is a member of the MPA Program faculty. Students should meet with their advisors each semester to develop a schedule before registering. Students are also encouraged to meet with the Program Coordinator.

Transfer Credit
Up to 6 credits taken at another University can be transferred to the MPA program on the recommendation of the Coordinator and the Dean of the Graduate School. In some cases, additional transfer credits may be accepted.

Comprehensive Examination
Upon completion of the core courses, each student must successfully complete a written comprehensive examination designed to test knowledge and/or skills of administrative analysis and administrative theory and practice. It is the responsibility of the student to take the requisite courses and the comprehensive examination in a timely-fashion. All MPA core courses are offered at least once a year during the fall, spring or summer semesters. Comprehensive exams are administered twice a year once in January and again in July. Comprehensive exams must be completed before students can take the capstone course, Directed Study or Research Applications.

Application for Degree
Students are required to file an “Application for Degree” with the Registrar’s Office in the semester prior to the one in which they plan to graduate. The due dates for this application are announced in the course catalog each semester.
Research Opportunities/Experiences
Many faculty have grants which help them employ graduate students to aid them in research.

Scholarships
1) The North Carolina City and County Management Association funds a scholarship for an MPA student to help train students for careers in North Carolina local government. The MPA Program selection committee nominates the eligible recipient each fall. 2) Burkhalter Alumni Scholarship. The MPA Alumni Association has established a scholarship fund to honor a former Charlotte City Manager. 3) Other awards are available on a competitive basis through the Graduate School. 4) Other professional associations occasionally offer scholarships

Tuition Waivers
Out-of-state tuition waivers are available to students appointed to graduate assistantships. These are awarded on a competitive basis. Partial waivers of in-state tuition are also awarded competitively to students who are residents of North Carolina. A limited number of partial tuition awards are made available through the Graduate School.

Financial Assistance
Other forms of financial aid, such as loans, are available. Students should contact the Financial Aid Office at 704-547-2461 for further information. Several administrative units on campus also employ graduate students.

COURSES IN PUBLIC ADMINISTRATION

MPAD 6000. Topics for Graduate Study in Public Administration. (1-4) Intensive study of a topic in public administration. The topic of investigation may vary from semester to semester. May be repeated for credit. (On demand) (Evening)

MPAD 6102. Legal and Institutional Foundations of Public Administration. (3) Consideration of the political context of contemporary public administration, with attention to the role of administration in the policy process, the legal basis for public administration, legislative-executive relations, and accountability and responsibility in democratic administration. (Fall, Spring) (Evening)

MPAD 6104. Theoretical and Ethical Foundations of Public Administration. (3) Changing images of people, organizations and organizational environments; research findings and applications related to organization structure, motivation, leadership, communications, decision-making, group dynamics, interpersonal skills; ethics and values important to the study and practice of organizational leadership; and assessment of value systems and the impact of competing value systems on public and organizational policy making. (Fall, Spring) (Evening)

MPAD 6125. Quantitative Research Methods in Public Administration. (3) Corequisite: MPAD 6125L. Prerequisite: elementary statistics or equivalent. Introduction to the use of quantitative analysis in administration. Special emphasis on issues of research design, data collection, elementary statistical analysis, and the interpretation and presentation of research findings. (Fall, Spring) (Evening)

MPAD 6125L. Computer Laboratory in Quantitative Research Methods in Public Administration. (1) Corequisite: MPAD 6125. Hands-on computer experience to master the substantive materials taught in Quantitative Research Methods. (Fall, Spring) (Evening)

MPAD 6128. Public Policy Analysis and Program Evaluation. (3) Analysis of the policy making process with particular attention to the role of public administration. Development and application of policy analysis methods, methods of evaluation, research design and measurement, and methods to incorporate program evaluation with planning, budgeting and personnel management. (Fall or Spring) (Evening)

MPAD 6131. Public Budgeting and Finance. (3) An introduction to the basics of public finance and an examination of the theory and development of public budgeting, the budget processes, the budget cycle, budget reforms, capital budgets, revenue sources, taxation policies and processes, intergovernmental fiscal relations and governmental accounting practices, debt management and cash management in public organizations. (Spring) (Evening)

MPAD 6134. Human Resources Management. (3) Study of the context of public personnel administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety; collective bargaining; government productivity. (Same as HADM 6147) (Spring) (Evening)

MPAD 6140. Labor Management Relations in Government. (3) Public employee unionization, collective bargaining, unit determination and recognition; negotiation; third-party process; administration of agreements. (On demand) (Evening)

MPAD 6141. Conflict Management in Public Organization. (3) The role of the administrator as a focal point in social change and the management of the conflict, which occurs. Perspectives on the negotiation and bargaining process will be reviewed. (On demand) (Evening)

MPAD 6144. Changing the Public Organization. (3) Overview of concepts and methodologies of organization development, diagnosing organizational needs, change strategies and interventions. (On demand) (Evening)

MPAD 6160. Information Systems in Public Administration. (3) Issues involved in administering and managing information system resource activities in public organizations. Topics include the system development life cycle including issues ranging from information system design and development through installation and evaluation. Special emphasis on challenges to achieving improved performance through information technologies in the public sector. (On demand) (Evening)

MPAD 6170. Communication Law and Policy. (3) This course is designed for those students with an interest in the law of public communication. Subjects such as First Amendment theory, censorship, hate speech, libel, invasion of privacy, obscenity, indecency, and commercial speech rights will be examined. Through a casebook and lecture approach, students will become well versed in current Constitutional law in these and other areas. No prior legal coursework is required. (On demand) (Evening)

MPAD 6172. Administration of the Health Care Systems in the United States. (3) Components of the health care system in the United States, with emphasis on the relationships among public (local, state and federal), private, voluntary and nonprofit entities; including points of access for recipients of health care; relationships with other human services and professions involved in providing health care; and the regulatory environment governing these relationships. (Same as HADM 6112) (On demand) (Evening)

MPAD 6174. Public Policy and Politics in Health Care Administration. (3) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. (On demand) (Evening)

MPAD 6176. Trends and Issues in Health Administration. (3) Examination of current issues confronting health care managers and an assessment of current programs and management responses to emerging trends in the health care field, including delivery systems, marketing/competition, strategic planning, financial management and/or epidemiological changes. (On demand) (Evening)

MPAD 6185. Intergovernmental Relations. (3) Survey of the complex relationships of governments in an urban environment set in the federal system. A review of the problems created by that system and the approaches to their solutions. (On demand) (Evening)

MPAD 6187. Advanced Seminar in Public Management Problem Solving. (3) Seminar viewed as a capstone to the student's coursework in public management and is required to be taken by all students. Seminar devoted to topics in public management, which involve problem identification and solution. Permit Only. (Fall, Spring) (Evening)

MPAD 6188. Research Applications in Public Administration. (3) Prerequisite: all core courses and passing of comprehensive examination. Preparation of a major paper on a topic of significance in public or nonprofit administration. Topics must be approved by the instructor, and paper drafts will be revised by the student following evaluation by the instructor. Each paper must be well grounded in the appropriate professional literature and must demonstrate competence in professional communication skills. Permit Only. (Fall, Spring) (Evening)

MPAD 6210. Aging and Public Policy. (3) Examination of the public policy making process with attention to aging policy. Consideration of determinants of aging policy and institutions and actors in the policy making process and piecemeal development of legislation will be analyzed as factors related to the making of policy for the aged. (Same as GRNT 6210) (Yearly) (Evenings)

MPAD 6211. Administration of Aging Programs. (3) Focus will be the implementation of public policies and programs for the aged and the development and administration of these programs. Students will become familiar with the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be considered. (Same as GRNT 6211) (Yearly) (Evenings)

MPAD 6310. Foundation of the Nonprofit Sector. (3) Survey of the history, culture and legal foundation of the nonprofit sector. Key definitions, scope and relationships between the nonprofit, for profit and government sectors are discussed. Examines current policy issues confronting nonprofits. (Fall)

MPAD 6311. Introduction to Nonprofit Management. (3) Examination of the structure, function and administration of nonprofit organizations. Developing strategies to insure financial and ethical management. (Spring)

MPAD 6320. Strategic Planning for Nonprofit Organizations. (1) Long and short range planning. Developing mission statements, conducting environmental assessments, writing, implementing, evaluating, and revising the plan will be covered. Addresses strategies for incorporating staff, board and community viewpoints. (On Demand)

MPAD 6321. Resource Development in Nonprofit Organizations. (1) How nonprofit organizations set
revenue goals, select fund-raising techniques, allocate personnel and volunteers and evaluate results. How nonprofit organizations should manage their relationships with different funding sources to maximize fund raising potential. (On Demand)

**MPAD 6322. Volunteer Management. (1)** Examines the changing role of volunteerism in the nonprofit organization. Topics include developing a strong and diverse volunteer work force and recruiting, screening and placement, orienting, managing, evaluating and recognizing volunteers. (On Demand)

**MPAD 6323. Grant Writing. (1)** Topics include conducting prospect research, making initial contacts with funders and preparing, submitting and following up on grant proposals. (On Demand)

**MPAD 6324. Financial Analysis for Government and Nonprofit Organizations. (3)** Topics include fund accounting basics for government and nonprofit organizations, preparation and analysis of financial statements, evaluating and monitoring financial condition, capital budgeting and investment analysis, debt policy and management. (On Demand)

**MPAD 6325. Legal Aspects of Nonprofit Organizations. (1)** The legal requirements and issues of liability for nonprofit organizations. These include: required financial reports; tax-exempt status; tort liability; and legal responsibilities of boards of directors. (On Demand)

**MPAD 6800. Directed Study in Public Administration. (3)** Prerequisite: all core courses and passing of comprehensive examination. Individual project proposal on a directed topic of significance based on field experience in public administration. Pass/In Progress grading. Permit Only. (Fall, Spring) (Evening)

**MPAD 6801. Directed Study in Public Administration. (3)** Prerequisite: MPAD 6800. Individual project report on a directed topic of significance based on field experience in public administration. Pass/In Progress grading. Permit Only. (Fall, Spring)

**MPAD 6820. Independent Study. (1-3)** Prerequisite: consent of the instructor and the MPAD Coordinator. Supervised study of a public administration topic or problem of special interest to the student, within the instructor’s expertise, and normally an extension of previous coursework with the instructor. (Fall, Spring, Summer)

**MPAD 7999. Graduate Residence. (1)** Maintains continuous enrollment as required by University policy. (Fall, Spring) (Evenings)

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**PUBLIC POLICY**

**Ph.D. in Public Policy**
704-687-2013
http://www.uncc.edu/gradmiss/ppolindex.html
http://www.uncc.edu/ppol/

**Degree**
Ph.D.

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Dr. Kathleen Donohue
Dr. Daniel Dupre
Dr. Karen Flint
Dr. Owen Furuseth
Dr. Donna Gabaccia
Dr. John Gandar
Dr. R. Kenneth Godwin
Dr. David Goldfield
Dr. William Graves
Dr. Edd Hauser
Dr. Rosemary Hopcroft
Dr. Gerald Ingalls
Dr. Hilary Inyang
Dr. Gary Johnson
Dr. Martin Kane
Dr. Suzanne Leland
Dr. Janet Levy
Dr. J. Dennis Lord
Dr. Vivian Lord
Dr. Schley Lyons
Dr. William J. McAuley, Jr.
Dr. William McCoy
Dr. Roslyn Mickelson
Dr. Gregory Mixon
Dr. Tyrel G. Moore
Dr. Steven Ott
Dr. Gerald Pyle
Dr. Gary Rassel
Dr. Benjamin Russo
Dr. Teresa Scheid
Dr. Peter Schwarz
Dr. Dena Shenk
Dr. Heather Smith
Dr. Heather Thompson
Dr. Peter Thorshem
Dr. Rosemarie Tong
Dr. Jennifer Troyer
Dr. Wayne Walcott
Dr. James Walsh
Dr. Murray Webster
Dr. Joseph Whittmeyer
Dr. Jy S. Wu
Dr. Wei-Ning Xiang
Dr. Diane Zablotsky

Program of Study
The Ph.D. in Public Policy at UNC Charlotte is an interdisciplinary program focusing on the study of urban regional development. It stresses the development of skills, tools, and specialties that contribute to our understanding of the structure of urban/regional systems and sub-systems and of how policy should be shaped within urban regions.

The Ph.D. in Public Policy at UNC Charlotte prepares students to be researchers, decision makers and/or policy analysts in academia, local, state or federal government and not-for-profit and for-profit institutions. The Program stresses applied and empirical policy research that is grounded in an interdisciplinary theoretical foundation. Thus, students will become both versed and versatile in analytical techniques suitable for research and policy analysis to address substantive issues and problems in the context of urban regions. The intellectual focus of the Program is guided by three overarching themes: (1) Interdisciplinary Perspective: Effective policy analysis and policy formation are not informed by any single discipline. Rather, public policy requires the acknowledgement of historical, cultural, political, institutional, geographic, and economic dimensions of urban places. (2) Applied and Empirical Policy Analysis: Public policy is an inherently applied endeavor that seeks practical solutions and cogent analysis. While all research and analysis is informed by theory, the purpose of policy research is to elevate public discourse and improve public decision-making. (3) Place-Based Research: To exercise applied policy analysis in an interdisciplinary context, policy research must be place-based. Real policy analysis, based on real data, applied to actual urban settings is the strength of the Program.

Admission Requirements
The following are general guidelines for successful admissions into the Ph.D. in Public Policy:

1) A master’s degree in a social science or other field related to policy studies is required for admission to full standing in the Ph.D. in Public Policy.
2) Exceptional performance at the master’s level is required. This means a GPA of at least 3.5 in the masters degree program is required for admission. Students with baccalaureate degrees may be admitted on a conditional basis if they have an overall undergraduate GPA of at least 3.2 and are currently enrolled in a master’s level program at UNC Charlotte in a field related to policy studies. But such students will not formally be admitted to the Ph.D. program until completion of the requirements for the master's degree.
3) Admission to the program will require strong scores on the quantitative, verbal, and analytic sections of the Graduate Record Examination. An average score of 500 on these three components of the Graduate Record Examination should be considered the minimum for admission. The Graduate Record Examination is a required part of the application package.
4) Three strong, positive letters of recommendation, at least two of which must come from faculty in the student’s previous academic programs. All letters should be written by individuals in a position to judge the applicant’s likely success in a Ph.D. level program. Letters should address the applicant’s suitability for a Ph.D. program and ability to complete the program in a timely fashion. Letters from the student’s master’s level program are preferred.
5) Students who are not native English speakers will be required to score at least 550 on the TOEFL exam, as well achieve a minimum score of 55 on each of the components of the TOEFL, or a 220 on the computer based TOEFL.
6) Students entering the program will be expected to remedy any course work deficiencies identified by their advisory committee in the first semester after enrolling in the program. The amount and kinds of remedial course work required for the program will depend on the background of the student and will be established by the Graduate Admissions Committee and the student’s advisory committee. Possible deficiencies are indicated in the prerequisites for the required core courses of the program. However, it is important to note that this program will emphasize the quantitative and analytical skills necessary to confront the challenges of urban and regional growth and development.

Documents to be submitted for application for admission:
1) Official transcripts from all colleges and universities attended
2) Official GRE scores (verbal, quantitative, and analytical)
3) The UNC Charlotte application for graduate admission form
4) Three letters of reference from academics who have taught or worked directly with the applicant.
5) An essay that addresses professional goals and motivation for pursuing the degree, suitability for the program, career goals following the degree, and the policy specialty the applicant would pursue within the Program.
6) TOEFL scores (if the student is not a native English speaker)

Admission Assessment
1) An Admissions Committee will review applications and recommend to the Program Director whether each applicant should be admitted or not and, if so, under what conditions.
2) The Program’s Admissions Committee will assess each student’s previous academic coursework in light of the student’s stated direction of study. This assessment will be used to identify the strengths and weaknesses of the student’s previous academic history and to suggest specific course work for the student’s public policy program. The amount and kinds of any remedial course work required for the program will depend on the student’s background and will be established by the Admissions Committee and confirmed by the Program Director. The Admissions Committee may also suggest specific coursework based on the student’s intended direction of study within the program. The Admissions Committee will conduct this assessment upon the student’s acceptance and formal declaration of intent to attend. For each entering student, a member of the Public Policy Faculty will be selected to serve as his or her major advisor for the first year in the Program.

Student Responsibility
Students entering the program must present evidence that their background is sufficient to undertake the coursework required of them. Such evidence must include:
1) familiarity with political and legal processes, behaviors, and institutions;
2) the nature of urban regions;
3) a graduate level social science methods or statistics course;
4) college course work in both macro- and micro-economics;
5) a course in Geographic Information Systems (GIS); and
6) substantial background in a public policy specialty area
Students may have completed equivalent courses elsewhere. Normally, transcripts will provide the evidence required by the Admissions Committee. However, if the student’s previous experience is offered as evidence, the student must provide all the documentation necessary to specify such experience. A more detailed list of the types of pre-requisite coursework can be found on the Program’s website.

Degree Requirements
The total number of hours in a student’s program will be established by the student’s advisory committee according to a plan of study that must be presented after the successful completion of 18 hours of coursework. It is unlikely that students will be able to complete this degree, including mastery of a subject-matter specialty, in less than 65 hours.

The Required Core Courses: The Ph.D. Program requires 33 hours of core course credit:
- Nature of the Field: PPOL 8600, PPOL 8601, PPOL 8610, PPOL 8690;
- Methods of Analysis: PPOL 8620, PPOL 8621, PPOL 8622;
- Applying Public Policy Analysis: PPOL 8630, PPOL 8635;
- Economic Analysis: PPOL 8640, PPOL 8641.

The Specialty Area Coursework: In order to address the conceptual and policy development issues required to produce and manage regional growth and development, students must also have significant specific knowledge of some policy sector. The student must successfully complete the number of hours required by one of the specialty areas offered by the Ph.D. in Public Policy. These specialty areas include: Health Policy; Urban Regional Development; Environmental, Energy and Infrastructure (under development); and Justice and Social Policy (under development). The student’s advisory committee and the Director of the Program must certify that the student has satisfied the subject matter specialty requirement before work on the dissertation begins. While the particular courses required in each specialty area may vary according to pre-requisites needed by the student or individual programs of study, the minimum number of required courses in any given specialty area is 5 or 15 credit hours.

Qualifying Examinations and Admission to Candidacy: After completion of the core courses, the student will be required to write a qualifying exam covering the nature of the field, method of analysis and applied skills. Following successful completion of core examination, students will be required to write a qualifying exam covering their area of specialty expertise. Successful completion of both core and specialty examinations allows student to proceed to the dissertation proposal preparation and oral defense.

The Dissertation: The Program requires that the student focus in 18 hours of dissertation credit (enrollment contingent on admission to candidacy). The dissertation topic may be proposed after the student has passed the qualifying exams. The doctoral student advances to candidacy after the dissertation proposal has been defended to, and approved by, the student’s advisory committee and reported to the Director of the Ph.D. in Public Policy and the Dean of the Graduate School. The student must then complete 18 hours of dissertation. The student must complete and defend the dissertation based on a research program approved by the student’s dissertation committee that results in a high quality, original, and substantial piece of research.

Grades required: A student must maintain a cumulative average of 3.0 in all course work taken for graduate credit.
An accumulation of two C grades will result in termination of the student’s enrollment in the graduate program. If a student receives a grade of U in any course, enrollment in the program will be terminated.

**Amount of transfer credit accepted:** The Program will accept up to two courses in the core curriculum as transfer credit from other regionally accredited doctoral institutions, providing that the Admissions Committee determines that the course or courses to be transferred are equivalent to some course or courses offered in the core or one of the specialty areas. The grade in these transfer courses must have been A or B. All of the dissertation work must be completed at UNC Charlotte.

**Residency Requirement.** The student must satisfy the residency requirement for the program by completing 21 hours of continuous enrollment, either as course work or dissertation credits. Residence is considered continuous if the student is enrolled in one or more courses in successive semesters until 21 hours are earned.

**Time limits for Completion.** The student must achieve admission to candidacy within six years after admission to the program. All requirements for the degree must be completed within eight years after first registration as a doctoral student. These time limits are maximums; full-time students will typically be expected to complete the degree requirements in five years.

**Courses IN PUBLIC POLICY**

**PPOL 8600. Policy Process I.** (3) Prerequisites: Prior course work or experience relevant to political and legal processes, behaviors, and institutions. Examination of the field of public policy analysis to include both theory and practice. Process includes everything from sources of public problems to feedback mechanisms after policy implementation. Emphasis on the policy process as it occurs in growing urban regions and the ability to communicate with stakeholders to determine value conflicts and to communicate possible policy solutions. Examination of the context (legal, institutional, historical, philosophical, social, political, physical and spatial) within which policy is made with sensitivity to gender, race and ethnicity, and class concerns. *(Fall)*

**PPOL 8601. Policy Process II.** (3) Prerequisite: PPOL 8600. Continuation of 8600, Policy Process I. Includes more specific application of theory to specific public problems in a variety of specialties, and the variation in communication problems that arise in these sub-systems. Emphasis on the interaction of all aspects of urban regions, which produce public problems and determine which policies will be acceptable and effective. *(Spring)*

**PPOL 8610. Urban Regional Environment.** (3) Prerequisite: Prior course work or experience relevant to the nature of urban regions. Examination of the nature of urban regions. The basic factors that shape urban regions as they grow. Impact of: geography; history; social factors; economic factors; concerns about gender, race and ethnicity, and class; and other determinants of the nature of urban regions, their problems, and possible policy solutions. *(Fall)*

**PPOL 8620. Quantitative Methods in Public Policy I.** (3) Prerequisite: graduate level social science methods or statistics course. Advanced quantitative methods as applied to analysis and solution of public problems. Use of quantitative methods to analyze public problems; devise appropriate, effective, acceptable public policies; evaluate public programs; and present the results of quantitative analysis to appropriate audiences. *(Fall)*

**PPOL 8621. Quantitative Methods in Public Policy II.** (3) Prerequisite: PPOL 8620, Quantitative Methods in Public Policy I. Advanced quantitative methods as applied to analysis and solution of public problems. Use of quantitative methods to analyze public problems; to devise appropriate, effective, acceptable public policies; to evaluate public programs; and to present the results of quantitative analysis to appropriate audiences. *(Spring)*

**PPOL 8622. Qualitative Methods in Public Policy.** (3) Advanced qualitative methods as applied to analysis and solution of public problems. Use of qualitative methods to analyze public problems, devise appropriate, effective, and acceptable public policies; evaluate public programs; and present the results of qualitative analysis to appropriate audiences. *(Spring)*

**PPOL 8630. Advanced Program Evaluation.** (3) Development and application of policy analysis to the evaluation of existing public policies. Particular attention to the use of multiple techniques of analysis and presentation of program evaluations to relevant audiences. *(Fall)*

**PPOL 8635. Ethics of Public Policy.** (3) Ethical questions in the study, formation, implementation, and evaluation of public policies. Ethical dilemmas faced by the public policy analyst, and the importance of use of values analysis. Emphasis on understanding how values are communicated by a variety of stakeholders in policy systems and how communicating public policy solutions involves an understanding of the role of values in successful policy formation and implementation. *(Spring)*

**PPOL 8640. Economic Analysis of Public Policy I.** (3) Economic role of government, efficiency versus equity, externalities, and public goods, market failures and government failures, economics of centralized versus decentralized decision making, public choice theory, economics of privatization, economic role of non-profits and non-governmental organizations. *(Fall)*

**PPOL 8641. Economic Analysis of Public Policy II.** (3) Prerequisite: PPOL 8640. Economics of taxation and
government borrowing, benefit-cost analysis, regional
growth and development, econometric analysis of local
and regional public policy issues. (Spring)

PPOL 8690. Seminar in Public Policy. (1) Public
Policy Seminar Series. Students in the program will
develop their appreciation of the varied nature of policy
applications and improve their communications skills by
participating in at least three seminar series throughout
the course of their program. Each term a series of guest
speakers will prepare monthly seminars reflecting a range
of policy issues and challenges. Following the guest
speaker series students will, at the end of term, be asked
to prepare an oral critique of a selected speaker and their
topic. (Fall/Spring)

PPOL 8800. Topics in Public Policy. (3) Selected
topics in public policy analysis. Course may be repeated
for graduate credit. (On demand)

PPOL 8801. Dissertation. (1-9) Prerequisite: passage of
qualifying examinations, and approval of dissertation
topic by the student’s advisory committee. In-depth study
of a practical problem in public policy. Analysis of the
problem, preparation of a policy solution, and
presentation of the solution to appropriate stakeholders
and the public. Pass/no credit grading. Maximum of 18
hours allowed under this course designation. (Fall, Spring,
Summer)

PPOL 9999. Dissertation Residence. (1) Prerequisite:
completed enrollment in 18 hours of dissertation with
grade of IP, In Progress. This course is to allow a student
who has taken all permissible 18 hours of dissertation to
remain in residence to finish work on the dissertation.
Pass/no credit grading. Credit for this course does not
count toward the degree. (Fall, Spring)

Notes on course frequency and prerequisites:

1) The core courses listed above are available only to
students admitted into the Ph.D. in Public Policy or
to students admitted to other Ph.D. programs.
2) Consent of the instructor is required on all classes in
the Public Policy Ph.D.
3) There are no specific prerequisites for the courses
listed above; however the general levels of
preparation are described in greater detail on the
program’s website.
4) Many of these courses will be offered during one of
the summer sessions as well as during the semester
specified in the course description.

SOCIOMETRY

Department of Sociology
476 Fretwell Building
704-547-4296
http://www.uncc.edu/gradmiss/sociomas.htm

Degree
M.A.

Coordinator
Dr. Teresa L. Scheid

Graduate Faculty
Charles J. Brody, Full Professor and Chair
Judy R. Aulette, Associate Professor
Thomas R. Forrest, Associate Professor
Rosemary L. Hopcroft, Associate Professor
Larry M. Lance, Associate Professor
Roslyn Mickelson, Professor
James Peacock, Assistant Professor
Michael A. Pearson, Associate Professor
Lisa Slattery Rashotte, Assistant Professor
Teresa L. Scheid, Associate Professor
Murray Webster, Professor
Dr. M. Dwayne Smith, Professor
Dr. Joseph Whitmeyer, Associate Professor
Dr. Diane Zablotsky, Associate Professor

The Master of Arts in Sociology degree program provides
students with the theoretical and methodological skills
necessary to undertake analysis of contemporary social
issues and problems. The concentration in Applied
Research is designed to meet the needs of students
seeking master’s level research skills in occupations
requiring such expertise: in government, marketing,
program planning and evaluation, business, the media and
in the non-profit sector. The curriculum also prepares
students who wish to pursue a Ph.D., whether in
Sociology or a related discipline (such as Criminology or
Public Policy). The Department is proud of its great
diversity in substantive interests and theoretical
perspectives. At the same time, it gives special emphasis
to the following specialty areas: family, gerontology,
health, education, and social psychology.

Program of Study
Coursework in the program concentrates on building
skills in research design, data analysis, interpretation and
application of sociological theory to concrete problems.
In addition to traditional classroom courses, students can
tailor their coursework to specific areas of interest
through individualized tutorials (up to 6 hours). Tutorials
involve directed reading and/or research in a specialized
area. Through coursework and tutorials students can gain
a substantial knowledge base that complements their
research skills. Students complete a thesis with an oral
defense or else a research practicum. Either option
entails the student applying sociological knowledge to a
problem/topic of their interest.
Additional Admission Requirements
1) An overall undergraduate GPA of 3.0 or better
2) An acceptable score on the Aptitude Portion of the Graduate Record Examination (GRE)
3) Completion of a minimum of 18 hours in undergraduate coursework in the social sciences, including social theory
4) Demonstrated undergraduate competence in research methods and statistics for social research.

Prerequisite Requirements
Sociological Theory, Research Methods, Statistics for Social Research

Degree Requirements
The program requires 35 semester hours of coursework. To provide all students with a solid grounding in theory and methods of sociological inquiry, 12 hours of core courses are required. In addition to the core, students must take one additional course in Applied Research Methods, and two courses in Social Institutions (see below). Students must then complete either a thesis (6 hours) or a research practicum (6 hours). The remaining 11 hours are electives, of which only 6 hours can be from outside the department. Students may transfer in up to 6 hours of credit from another institution.

Students must earn at least a B in core, required classes (Social Theory, Statistics, Research Methods, and Dilemmas in Organizations). Students earning a C in one of these courses must repeat the course the next time it is offered. Students earning a C in two of these courses will be disenrolled from the program.

Admission to Candidacy Requirements
Completion at least 24 hours of required work.

Assistantships
The Department of Sociology has four teaching assistantships and several research assistantships, dependent upon faculty research funding. Teaching assistants assist faculty with coursework, or teach the undergraduate lab sections in research methods and statistics and are paid approximately $8,000.00 for nine months at twenty hours per week during the academic year. The workload and pay for research assistants varies. Assistantships are awarded on the basis of merit and experience.

Internships
While there is not a formal system of ongoing internships, agencies do contact the department to find students who would be interested in an internship. Consequently, internships are optional and dependent upon a match between an agency’s needs and a student’s skills and interests.

Practicum
There is the option of a research practicum, which may be combined with an internship. The student would work with an organization or agency and complete a research evaluation project for the agency. This is for 6 hours of credit and is an alternative to the traditional thesis.

Core Courses
SOCY 5151 Pro-Seminar: Social Problems and Social Policy (3) (Fall)
SOCY 6651 Social Theory (3) (Fall)
SOCY 6652 Issues in Social Research (3) (Spring)
SOCY 6653 Advanced Quantitative Analysis (3) (Fall)

Applied Social Research (students must take one course from this menu)
SOCY 6136 Qualitative Research Methods
SOCY 6617 Data Utilization
SOCY 6630 Investigating Health and Health Services
SOCY 6640 Evaluation Research for Applied Sociology

Social Institutions (students must take at least two courses from this menu)
SOCY 6130 Sociology of Aging
SOCY 6135 Social Context of Schooling
SOCY 6137 The Political Economy of School Reform
SOCY 6138 The Social Organization of Health Care
SOCY 6614 Dilemmas in Organizations
SOCY 6616 Stratification and Aging

Capstone Experiences
Thesis or Research Practicum

Electives
Students may take electives (up to 6 hours) from other departments as long as courses are at the graduate level (5000 or above).

Advising
The Graduate Coordinator advises all graduate students until they select a person to serve as their Committee Chair.

Transfer Credit
With departmental approval, students may transfer up to six hours of graduate work for which the applicant received a grade of B or better from another institution or related UNC Charlotte program.

Committee
The students committee shall consist of three faculty: the Chair and two other individuals who assist with completion of the thesis or research practicum. One
member of the committee may be from outside the department.

**Thesis**

Students are to formulate a research question or argument, and to collect evidence to answer that question, or support their argument.

**Research Opportunities/Experiences**

All faculty are actively engaged in research, and students are strongly recommended to work with faculty to develop research expertise. In addition, a number of faculty have funded research projects or internships which qualified graduate students are able to work on.

**Tuition Waivers**

Both out of state and in-state tuition waivers are available.

**Financial Assistance**

Contact the Department about Graduate Assistantships

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**COURSES IN SOCIOLOGY**

**SOCY 5111. Social Inequality. (3)** Distribution of power, privilege and prestige; correlates and consequences of inequality; national and international comparisons.

**SOCY 5125. Urban Sociology. (3)** Cross cultural analysis of urban development, social structure, ecology, demographic composition, and social problems.

**SOCY 5130. Sociology of Health and Illness. (3)** The cultural and structural influences on the definition of health and illness; models of illness behaviors; health demography and epidemiology; social influences on the delivery of health care; ethical issues surrounding health and illness; the development of relevant social policy.

**SOCY 5131. Family Policy. (3)** Critical analysis of four aspects of family policy; the historical and cultural factors that have resulted in specific policies affecting the family; the specification of contemporary family policy at both the national and state level; the intended and actual application of existing family policy; and the implications and impact of policies as they are interpreted and implemented.

**SOCY 5134. Families and Aging. (3)** Theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society; examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications.

**SOCY 5135. Sociology of Education. (3)** Educational institution; the school class as a social system; the school as a social environment and a complex organization.

**SOCY 5150. Older Individual and Society. (3)** Review of the theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society. Examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications.

**SOCY 5151. Pro-seminar: Social Problems and Social Policy. (3)** Prerequisite: graduate student in sociology or senior sociology major. Introduction to applied sociology, proposal writing and grantsmanship, professional ethics and professional socialization. Overview of major research areas in applied sociology.

**SOCY 5154. Contemporary Social Theory. (3)** Elements and process of theory construction; contemporary social theories such as theories of social order and causation, power, class structure and inequality; group process theories; post-modern theories.

**SOCY 5631. Seminar in Family Violence. (3)** Prerequisite: senior, graduate student or consent of the instructor. Family violence in the context of a changing society and family system. Principal foci: child abuse, sexual abuse, spouse abuse; other forms of family violence. Investigation of these topics in terms of sociocultural influences and internal dynamics of families. (Spring) (Evenings)

**SOCY 5632. Changing American Family. (3)** Family theories; family system in relation to other social systems; integration of marital, parental and occupational roles in context of changing socioeconomic influences; traditional versus contemporary family roles; breakdown in stable family functioning. (Fall) (Evenings)

**SOCY 6090. Topics in Sociology. (3)** Prerequisite: consent of department. Intensive treatment of a topic or survey of related topics, depending on student needs and interests. may be repeated for credit as topics vary. (On demand)

**SOCY 6130. Sociology of Aging: Theories and Research. (3)** Application of stratification theories and demography are applied to the older population. Issues of race, gender, socio-economic status, age, and geographic distribution are examined to investigate the diversity of the older age group and their access to resources. (Yearly)

**SOCY 6135. Social Context of Schooling. (3)** The political economy of schooling; race, class, and gender effects on educational processes and outcomes; the school as a complex organization; the sociology of school reform movements. (Fall)

**SOCY 6136. Qualitative Research Methods. (3)** Collection and analysis of qualitative data including use of grounded theory and a variety of qualitative techniques, consideration of ethical issues and the use of data. (Alternate years)
SOCY 6137. The Political Economy and School Reform. (3) Prerequisite: SOCY 4135, graduate status, or consent of instructor. Relationship between the business community's vision for school reform and the school restructuring movement locally and nationally, including social and political processes associated with corporate involvement in defining the problem with schools and shaping solutions, the intersection of education and the economy, and the relationship between schooling and social inequality. (On demand)

SOCY 6138. Social Organization of Health Care. (3) Focuses on the structures and operations of health care institutions and providers. The topics covered include the socio-historical development of the existing health care system, health care occupations and professions, professional power and autonomy, professional socialization, inter-professional and provider-patient relations, health care organizations and the delivery of services, and how social change affects the health care sector. (On demand)

SOCY 6144. Self and Society. (3) Examination of theoretical constructs and substantive concerns relevant to the socialization process; comparison of symbolic interactionism, ethnomethodology, phenomenology; emphasis on social construction of reality in various “social worlds” (deviant, work, family). (Alternate years)

SOCY 6154. Dilemmas in Organizations. (3) Examines organizational theory and research focused on organizational behavior, inter-organizational relations, relations with external stakeholders and organizational culture. Case study analysis, group-problem solving and the study of concrete organizational dilemmas. (Fall)

SOCY 6164. Stratification and Inequality. (3) Examination of theories of stratification and the causes, processes and social consequences of economic and political inequality; assumptions behind, mechanisms for, and consequences of government and private sector strategies to address problems associated with inequality. (Alternate years)

SOCY 6174. Data Utilization. (3) Methodological and statistical strategies for applied sociological research within organizational settings; selecting the best strategies consistent with budgetary, manpower and organizational constraints; interpreting and communicating research results in ways understandable to and useful for organizational decision-makers. (Alternate years)

SOCY 6630. Investigating Health and Health Services. (3) Prerequisites: SOCY 4130, or graduate standing, or permission of instructor. Useful to those seeking research careers, to administrators in health care, and to primary care providers. How to conduct and evaluate research in health care settings, emphasizing both quantitative and qualitative methodologies as well as the utilization of secondary data. (Every other year)

SOCY 6640. Evaluation Research for Applied Sociology. (3) Prerequisites: SOCY 6652 and introductory statistics. Evaluation research from an applied sociological perspective, including incorporation of social theory, substantive social science knowledge, and research techniques into the evaluation of a variety of programs, interventions, and policies. (Alternate years)

SOCY 6651. Social Theory. (3) Analysis of contemporary social theories, with emphasis on their implications for planned change. (Yearly)

SOCY 6652. Issues in Social Research. (3) Examination of epistemology of social research; assumptions and methods of specific research strategies; ethical and policy issues of applied and academic research. (Alternate years)

SOCY 6653. Advanced Quantitative Analysis. (3) Prerequisites: six hours in Introductory Statistics and/or Research Methods. Contemporary techniques of data analysis, management and processing applied to specific topics; measurement models, data reduction strategies, and multivariate procedures. (Alternate years)

SOCY 6895. Tutorial in Sociology. (1-4) Prerequisite: permission of instructor. Directed reading and/or research; development of expertise in substantive area. May be repeated for credit. (Fall, Spring, Summer)

SOCY 6897. Research Practicum. (1-6) Prerequisite: SOCY 6651 and 6652. Preparation of research paper based upon research completed within a community organization or agency. The student will develop a consultant-client relationship with the agency or organization and conduct a research/evaluation project on behalf of the agency or organization (such as a needs assessment, program evaluation, social impact assessment or policy analysis. (Fall, Spring)

SOCY 6996. Thesis. (1-6) Prerequisites: completion of all other coursework and admission to candidacy by Graduate Committee. Applied, academic, or theoretical research project, defended before graduate faculty. May be repeated for credit up to six hours. (Fall, Spring, Summer)

SOCY 7999. Graduate Residence. (1) Continuation of individual thesis project. (Fall, Spring)
GENERAL GRADUATE COURSES IN ARTS and SCIENCES

ANTHROPOLOGY

ANTH 5090. Topics in Anthropology. (3) Prerequisite: consent of the instructor. Intensive treatment of a topic in anthropology or survey of related topics, depending on student needs and interest. May be repeated for credit as topics vary. (On demand)

ANTH 5120. Intercultural Communications. (3) Prerequisite: ANTH 1101 or consent of instructor. Learning to cope with cultural differences; contrasting value systems; cross-cultural and communication styles; nonverbal communication; cultural relativity; culture and perception; ethnocentrism; cultural shock. (Yearly)

ANTH 6132. Culture, Health and Aging. (3) Exploration of the interaction between culture and the aging experience, with a particular emphasis on issues of health and the health care system. (On demand)

PHILOSOPHY

PHIL 5050. Topics in Philosophy. (1-3) Prerequisite: Consent of the department. In-depth treatment of selected problems and issues in philosophy. May be repeated for additional credit as topics vary. (On Demand)

PHIL 6050. Topics in Philosophy. (1-3) Prerequisite: Consent of the department. In-depth treatment of selected problems and issues in philosophy. May be repeated for additional credit as topics vary. (On Demand)

PHIL 8050. Topics in Philosophy. (1-3) Prerequisite: Consent of the department. In-depth treatment of selected problems and issues in philosophy. May be repeated for additional credit as topics vary. (On Demand)

POLITICAL SCIENCE

POLS 6000. Topics for Graduate Study in Political Science. (1-4) Intensive study of a topic in Political Science. The topic of investigation may vary from semester to semester. May be repeated for credit. (On demand)

POLS 6800. Independent Study. (1-3) Prerequisite: consent of the instructor. Supervised investigation of a political problem that is (1) of special interest to the student; (2) within the area of the instructor's special competence; and (3) normally an extension of previous coursework with the instructor. A student may take more than one course under this number but not more than three hours a semester. (Fall, Spring, Summer)

RELIGIOUS STUDIES

RELS 5000 Topics in Religious Studies. (3) Prerequisite: consent of the instructor. May be repeated for credit. (On demand)

RELS 5010. Major Figure in Religious Studies. (3) The life and works of a major figure who has contributed to religious studies. May be repeated for credit for different figures. (On demand)

RELS 5101. Religion and Modern Thought. (3) The interaction of modern thought and modern religious sensibilities. (Alternate years)

RELS 5107. Early Judaism. (3) Prerequisite: RELS 2104 or 2105 or 3110 or consent of the instructor. Comparative historical and literary study of the varieties of Judaism evidenced during late antiquity (circa 70-640 CE), with special attention devoted to the information and development of rabbinic Judaism. (On demand)

RELS 5108. Medieval Judaism. (3) Prerequisite: RELS 2104 or 3110 or consent of the instructor. Comparative historical and literary study of the varieties of Judaism evidenced in Western Europe, the Byzantine Empire, and Islamicate realms from approximately 640 CE to approximately 1492 CE. (On demand)

RELS 5109. Modern Judaism. (3) Prerequisites: RELS 3110 or 4107 or 4108 or permission of the instructor. Historical and conceptual study of Judaism and Jewish experience in Europe, America, and Israel, from the 16th century to the present, with special attention paid to the development of denominations, Zionism, and the Holocaust. (On demand)

RELS 5110. Contemporary Jewish Thought. (3) An examination of philosophy, religion, morality, politics, sociality, culture, family, self-identity, in the light of modern and recent Jewish thought. (Alternate years)

RELS 5201. Religion, Culture and Morality. (3) Prerequisite: At least junior standing; one course in religious studies or ethics, or permission of the instructor. International/cross-cultural challenges and consequences of universal religious ethical systems versus religious relativism as the basis for moral theories and practices, including experiences and concerns of under-represented groups within religious moral systems. (On demand)

RELS 5204. Life-Study. (3) Prerequisites: Junior, senior or graduate standing. An appreciation of the religious dimension in a human life-history. Based on concepts, principles and methods developed by Ira Progoff for
working within the life-history of a person who lived in a previous generation. *(Yearly) (Evenings)*

**RELS 5205. Intensive Journal. (3)** Prerequisites: Junior, senior or graduate standing. Study of religion and holistic depth psychology. Practical experience of the Intensive Journal method concentrates on the outer and creative dimension in a life including applications to personal, educational, and professional life. *(Alternate years) (Evenings)*

**RELS 5215. The Artist as Visionary. (3)** The role of visual imagination in the development of religious sensibilities. *(On demand)*

**RELS 5216. Joseph Campbell. (3)** Prerequisites: Junior, senior or graduate standing. A study of the life and works of Joseph Campbell (1904-1987) and the implications of his work for the study of religion. *(Alternate years)*

**RELS 5218. Jung and Religion. (3)** Prerequisites: Junior, senior or graduate standing. The works of C.G. Jung as they relate to an understanding of religion and religious experience. Emphasis on his interpretations of myths and symbols as they appear in both Western and non-Western religions. His theories of creativity and the arts, religious expressions and quests for meaning. *(Yearly)*

**RELS 6000. Topics in Religious Studies. (1-3)** Prerequisites and credit hours vary with topics. Advanced topics in Religious Studies. May be repeated for credit as topics vary. *(On demand)*

**RELS 6800. Directed Studies. (3)** Prerequisite: consent of the instructor. May be repeated for credit. *(Fall, Spring)*

**WOMEN'S STUDIES**

**WMST 5050. Topics in Women's Studies. (1-3)** Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

**WMST 6050. Topics in Women's Studies. (1-3)** Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

**WMST 6800. Directed Reading/Research. (3)** Prerequisites: prior written permission of instructor and Women's Studies Director. Independent investigation of a problem or a topic in Women's Studies, culminating in a research paper or a final report. Student must provide a written plan of work before registering for the course. May be repeated for credit. *(On demand)*
The Belk College of Business Administration is accredited by AACSB International, the premier accrediting agency for academic programs in business administration and accounting. Our challenging courses give students the tools they need to succeed in business. Courses are taught by full-time faculty with Ph.D.s from top schools and whose research is highly sought after by industry executives. Students have the opportunity to network with professionals from a variety of fields, and interact with alumni and leaders from Charlotte’s dynamic business community. With flexible evening schedules and courses offered both at UNC Charlotte’s main campus and at our uptown campus in the heart of Charlotte’s center city, working professionals may earn their MBA degree without interrupting their career.

Graduate Degree Programs
- Master of Accountancy
- Master of Business Administration
- Master of Science in Economics

Graduate Non-Degree Programs
- MBA PLUS Certificate (Post-Graduate Certificate)

ACCOUNTING

Department of Accounting
259 Friday Building
704-687-2445
http://www.uncc.edu/macc

Degree
Master of Accountancy, MACC

Coordinator
Dr. Jack Cathey

Graduate Faculty
Cindy Blanthorne, Assistant Professor
Hughlene Burton, Assistant Professor
Jack Cathey, Associate Professor
Michael Cornick, Associate Professor
Nabil Elias, Associate Professor
Howard Godfrey, Professor
John Griffing, Adjunct Faculty
Michele Matherly, Assistant Professor
Laurie McWhorter, Assistant Professor
Richard Schroeder, Professor
Casper Wiggins, Big Five Distinguished Professor

Program of Study
The Master of Accountancy program is a multiple track program designed to prepare accountants for the rapidly changing expectations of the profession. It provides for specialization in financial accounting/auditing and in tax. The program also includes the option for development of an individualized program of study. Completion of the program will enable students to pursue licensure in states requiring 150 semester hours.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Accounting:
1) Acceptable scores on the verbal and quantitative portions of the Graduate Management Admission Test.
2) Either a baccalaureate degree in accounting or equivalent.

Students without an undergraduate degree in accounting from a U.S. University are encouraged to pursue an undergraduate degree in accounting prior to applying to the Master of Accountancy Program.

Degree Requirements
The program leading to the Master of Accountancy degree requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from another regionally accredited institution upon approval by the student's adviser and the Dean of the Graduate School. A 3.0 GPA is required in all courses taken for graduate credit and a maximum of two C's is permitted for continuation in the program. The residence requirement is satisfied by completion of at least three-fourths of the required courses while in residence. Neither a comprehensive examination nor a thesis is required.

The Master of Accountancy degree consists of 30 semester hours (10 graduate classes) of course work. The 30 hours are divided into two components: accounting classes and elective classes.

Admission to Candidacy Requirements
An Admission to Candidacy form listing graduate-level course that apply to the degree must be submitted to the Graduate Coordinator one month prior to the semester in which the student plans to complete the course work for the degree.

Assistantships
Assistantships are available on a limited and competitive basis.
Accounting Program Tracks

Financial Accounting/Auditing Track
The Financial Accounting/Auditing track is designed for students wishing to pursue careers in public accounting, consulting, and corporate accounting. The track is also appropriate for students who are interested in a broad exposure to accounting at the graduate level. The program is offered primarily during the daytime with limited offerings in the evening.

The required classes for this track are:
- ACCT 6210 Advanced Accounting Information Systems
- ACCT 6220 Advanced Auditing
- ACCT 6230 Advanced Managerial Accounting
- ACCT 5230 Advanced Income Tax
- ACCT 6250 Accounting Theory and Practice

In addition to the required classes a student is expected to complete five elective classes with at least three of the electives outside of the field of accounting.

Tax Track
The Tax track is designed for students who wish to specialize in taxation. The program is offered in the evening and is designed to permit both full-time and part-time study.

The required classes for this track are:
- ACCT 6110 Tax Research, Planning and Practices
- ACCT 6120 Taxation of Corporations and Shareholders
- ACCT 6130 Taxation of Partnerships and S Corporations
- ACCT 6140 Taxation of Estates, Gifts, and Trusts
- ACCT 6150 Business Tax Strategies

In addition to the required classes a student is expected to complete five elective classes with at least three of the electives outside of the field of accounting and taxation.

Individualized Track
The Individualized Track is designed for students with unique career and professional goals that are not met by the other tracks. Consultation with the Graduate Coordinator is recommended for this track.

Advising
Prior to, or concurrent with, the first semester of study each student will be expected to complete a program of study listing each class the student expects to take as a part of the program.

Application for Degree
An Application for Degree form must be completed and submitted with the graduation fee to the Registrar’s Office by the published deadline.

Program Certifications/Accreditation
The Belk College of Business Administration and the Department of Accounting are accredited by the American Association of Collegiate Schools of Business (AACSB).

COURSES IN ACCOUNTING

ACCT 5111. Advanced Financial Accounting. (3) Advanced concepts and practices in financial reporting with special emphasis on business combinations, consolidated financial statements and financial reporting issues and practices for governmental and other not-for-profit entities. In addition, the course will examine current topics and emerging issues. (Fall)

ACCT 5230. Advanced Income Tax. (3) An examination of advanced tax topics regarding corporations, partnerships, and individuals. In addition, estate and gift, fiduciary accounting, tax-exempt entities and retirement plans will be examined at an introductory level. (Spring)

ACCT 6110. Tax Research and Planning. (3) Tax research techniques applicable to federal tax law affecting individuals, corporations and partnerships, including use of traditional and computerized tax services to solve tax problems. Emphasis on tax planning principles and related tax practice matters, including handling tax compliance issues and dealing with the Internal Revenue Service. (Fall)

ACCT 6120. Taxation of Corporations and Shareholders. (3) Co/Prerequisite: ACCT 6110. This course examines the federal and state tax law applicable to corporations and their shareholders. The course covers tax compliance matters, strategies for minimizing tax liabilities and strategies for handling tax controversies. (Fall)

ACCT 6130. Taxation of Partnerships and S Corporations. (3) Prerequisite: ACCT 6110. Tax law applicable to partnerships and S corporations, including tax compliance matters strategies for minimizing tax liabilities and strategies for handling tax controversies. (Spring)

ACCT 6140. Taxation of Estates, Gifts, and Trusts. (3) Prerequisite: ACCT 6110. Wealth transfer taxes and taxation of estates and trusts, including integration of these taxes and tax planning opportunities for minimizing tax liabilities. (Summer)

ACCT 6150. Business Tax Strategies. (3) Prerequisite: consent of program coordinator. Tax strategies in all phases of business operations, including creation of the business, choice of the type of business entity, financing, operations, distributions to owners, expansion, reorganization and liquidation with emphasis on
minimizing taxes and avoid tax traps. Analysis of business planning cases and completion of a comprehensive project with the results presented in both an oral and written report. \((Spring)\)

**ACCT 6210. Advanced Accounting Information Systems.** (3) Documentation and evaluation of current accounting information systems, evaluation of potential new systems, to extract data from existing systems from analysis, and examination of emerging technologies which have potential uses in accounting information systems. \((Fall)\)

**ACCT 6220. Advanced Auditing.** (3) Audit practice, including the role of auditors in society, a study of legal liability issues, the theory of audit evidence, and analysis of internal control systems (including EDP), a review of audit regulations and ethics and the interpretation of audit reports. \((Fall)\)

**ACCT 6230. Advanced Managerial Accounting.** (3) This course covers advanced concepts and practices in managerial accounting including activity-based cost systems, activity-based management, theory of constraints, transfer pricing, and performance measurement using the balanced scorecard. \((Fall)\)

**ACCT 6250. Accounting Theory and Practice.** (3) Prerequisite: consent of program coordinator. Financial accounting theory and practice, including research techniques, analytical skills, communication skills, professional judgment, international and ethics issues. \((Spring)\)

### BUSINESS ADMINISTRATION

**Director**

Dr. Nabil Elias  
Director of the MBA Program  
209 Friday Building  
704-687-2569  
704-687-4014 (fax)  
www.belkmba.uncc.edu

**Degrees**

MBA; MBA PLUS Certificate

**Graduate Faculty**

**Accounting**

Hughlene A. Burton, Assistant Professor of Accounting  
John M. Cathey, Associate Professor of Accounting  
Michael Cornick, Associate Professor of Accounting  
Nabil Elias, Associate Professor of Accounting  
L. Howard Godfrey, Chair and Professor of Accounting  
Laurie B. McWhorter, Assistant Professor of Accounting  
Richard G. Schroeder, Professor of Accounting

**Business Information Systems and Operations Management**

Frank C. Barnes, Professor of Operations Management  
W. Douglas Cooper, Professor of Operations Management  
Chris Craighead, Assistant Professor of Operations Management  
Alice Johnson, Assistant Professor of Management Information Systems  
Moutaz J. Khouja, Chair and Associate Professor of Operations Management  
Ram L. Kumar, Associate Professor of Management Information Systems  
John R. O'Malley, Jr., Assistant Professor of Management Information Systems  
Gordon H. Otto, Visiting Professor of Operations Management  
Stephanie S. Robbins, Associate Professor of Management Information Systems  
Cem Saydam, Professor of Operations Management  
Michael A. Smith, Assistant Professor of Management Information Systems  
Anthony C. Stylianou, Associate Professor of Management Information Systems  
Susan J. Winter, Assistant Professor of Management Information Systems

**Economics**

Louis “Ted” Amato, Professor of Economics  
John E. Connaughton, Professor of Economics  
W. Young Davis, Jr., Professor of Economics  
John M. Gandar, Chair and Professor of Economics  
Gaines H. Liner, Associate Professor of Economics  
Ronald A. Madsen, Professor of Economics  
Rob Roy McGregor, Associate Professor of Economics  
Benjamin Russo, Associate Professor of Economics  
Peter M. Schwarz, Professor of Economics  
Ellen M. Sewell, Assistant Professor of Economics  
Jennifer Troyer, Assistant Professor of Economics  
Richard A. Zuber, Professor of Economics

**Finance and Business Law**

Lloyd P. Blenman, Associate Professor of Finance  
William F. Kennedy, Associate Professor of Finance  
Ben H. Nunnally Jr., Professor of Finance  
Steven Ott, Professor of Finance  
D. Anthony Plath, Associate Professor of Finance  
Calvin W. Sealey, Chair and The Torrence E. Hemby, Sr., Distinguished Professor in Banking

**Management**

Joyce M. Beggs, Associate Professor of Management  
Rosemary Booth, Associate Professor of Management  
Claudio Carpano, Associate Professor of Management  
Richard M. Conboy, Associate Dean and Associate Professor of Management  
Kent E. Curran, Professor of Management  
Michael D. Ensley, Assistant Professor of Management
Program of Study
The primary objective of graduate study in business is to develop candidates for leadership positions in complex organizations. The MBA program focuses on developing the expertise to lead, influence, and persuade others through effective written and spoken communications; the ability to approach complex problems both systematically and imaginatively; the confidence to make decisions in the face of imperfect information, competing objectives, and technological change; the insight to recognize the ethical dimensions of organizational and individual decisions; the sensitivity to recognize that organizational decisions involve teamwork and consensus-building across diverse groups of individuals; and the awareness that business represents an inherently multinational enterprise that exists without geographical or cultural boundaries.

MBA courses are scheduled to accommodate part-time students and full-time students who may enroll in up to three courses each fall and spring semester. Classes are held in the evening throughout the year on campus and at UNC Charlotte Uptown. A part-time student can complete the program in three years. Full-time students may complete the program in two years, depending upon scheduling of courses.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Business Administration.
1) A generally satisfactory undergraduate record from an accredited college or university.
2) A satisfactory score on the Graduate Management Admission Test (GMAT) administered by the Educational Testing Service of Princeton, New Jersey.
3) A description of any significant work experience.

Degree Requirements
The MBA degree program comprises 42 graduate hours including a Functional Component and a Concentration and Free Elective Component. Up to 6 hours of course work may be transferred based on a recommendation of the relevant academic department and approval of the Director of the MBA program. Necessary preparatory work will be determined during the admissions process, and courses to meet the specific need will be available in the Preparatory Component. All students in the program must meet the Graduate School’s requirements for a Master’s Degree.

Preparatory Component
Prerequisites - These classes may be taken after admission to the MBA program or as a post-baccalaureate student. They are not required prior to admission to the MBA program. Courses in the MBA Preparatory Component must be completed before enrolling in 6000-level courses except by permission of the Director of the MBA program. Undergraduates in the Belk College of Business cannot take them for credit toward the bachelor’s degree.

I. Functional Component (27 hours)

A. Primary Block (12 hours)
*Prerequisites: All requirements for admission to the program and Preparatory Component, except as approved by the MBA director.
MBAD 6112 The Economics of Business Decisions (3)
MBAD 6121 Business Information Systems (3)
MBAD 6131 Managerial Accounting (3)
MBAD 6141 Operations Management (3)

B. Intermediate Block (12 hours)
*Prerequisites: All functional courses, listed above, in Primary Block and Intermediate Block should be completed before MBAD 6194 is taken.
MBAD 6152 Financial Management (3)
MBAD 6161 Organizational Leadership & Behavior I (3)
MBAD 6171 Marketing Management (3)
MBAD 6181 E-Business Concepts (3)

C. Advanced Block (3 hours)
*Prerequisites: All functional courses, listed above, in Primary Block and Intermediate Block should be completed before MBAD 6194 is taken.
MBAD 6194 Management Policy (3)
II. Concentration and Free Elective Component (15 hours)

Students complete nine hours of elective courses specified for a concentration, and six hours in free elective courses. Students who do not choose to complete a concentration will substitute nine hours in MBA electives for the nine hours in concentration electives. Students may enroll in electives as soon as they complete the prerequisites for each course.

A. Concentration Block (9 hours)
*Prerequisite: Specific course(s) in Functional Component required by each concentration elective.

**Business Finance**
Requirement: MBAD 6157, Theory of Corporate Finance, and two of the following courses:
- MBAD 5159 Student Managed Investment Fund II (3)
- MBAD 6151 Financial Institutions and Markets (3)
- MBAD 6153 Investment Management (3)
- MBAD 6154 Applied Business Finance (3)
- MBAD 6155 Multinational Finance (3)
- MBAD 6158 Real Estate Finance and Development (3)
- MBAD 6159 Real Estate Development (3)
- MBAD 6160 Real Estate Capital Markets (3)
- MBAD 6890 Directed Individual Study (3)

**Economics**
Requirement: Three of the following courses, must include ECON 6112 and ECON 6218. Approval of the Department of Economics is required before enrolling in 6000 level ECON courses or the Economics Concentration.
- ECON 6112 Graduate Econometrics (3)
- ECON 6201 Advanced Macroeconomic Theory (3)
- ECON 6202 Advanced Microeconomic Theory (3)
- ECON 6218 Advanced Business Forecasting (3)

**Electronic Business**
Requirement: Students must complete the following three courses:
- MBAD 6182 E-Business Systems (3)
- MBAD 6183 E-Business Marketing (3)
- MBAD 6189 E-Business Strategy (3)

**Financial Institutions/Commercial Banking**
Requirement: MBAD 6156, Commercial Bank Management, and two of the following courses:
- MBAD 5159 Student Managed Investment Fund II (3)
- MBAD 6058 Special Topics in Financial Services (3)
- MBAD 6151 Financial Institutions and Markets (3)
- MBAD 6153 Investment Management (3)
- MBAD 6154 Applied Business Finance (3)
- MBAD 6155 Multinational Finance (3)
- MBAD 6158 Real Estate Finance and Development (3)
- MBAD 6159 Real Estate Development (3)
- MBAD 6160 Real Estate Capital Markets (3)
- MBAD 6890 Directed Individual Study (3)

**Information and Technology Management**
Requirement: Three of the following courses.
- MBAD 6028 Topics in Information Systems (3)
- MBAD 6122 Technology-Enhanced Decision Making (3)
- MBAD 6124 Business Information Systems Development (3)
- MBAD 6125 Business Data Communications (3)
- MBAD 6890 Directed Individual Study (3)

**Management**
Requirement: Three of the following courses:
- MBAD 6162 Organizational Leadership and Behavior II (3)
- MBAD 6163 Human Resource Management (3)
- MBAD 6164 Executive Communication (3)
- MBAD 6191 Entrepreneurship (3)
- MBAD 6192 Business and Society (3)
- MBAD 6193 International Business Concepts (3)
- MBAD 6195 Strategic Management of Technology (3)
- MBAD 6196 Strategic Planning (3)
- MBAD 6197 International Business Strategy (3)
- MBAD 6890 Directed Individual Study (3)

**Marketing**
Requirement: Three of the following courses:
- MBAD 6172 Marketing Research (3)
- MBAD 6173 Promotional Strategy (3)
- MBAD 6174 International Marketing (3)
- MBAD 6175 Logistics Management (3)
- MBAD 6890 Directed Individual Study (3)

**Student Structured Concentration**
Students may propose a nine-semester hour, three-course concentration in a significant area of interest for approval by the Director of the MBA program. This concentration may include graduate courses from other programs within the University.

**B. Free Electives Block (6 hours)**
*Prerequisites: Specific courses in the Functional Component required by each free elective.

Students are strongly encouraged to select courses outside their area of concentration and to include a course with an international/global perspective as one of their free elective courses.

*Exceptions to prerequisites may be granted in special circumstances. Requests should be addressed in writing to the Director of the MBA program.*

**Minor in Operations Research**
The Master of Business Administration program also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See the listing for Operations Research for complete information and program requirements.
Admission to Candidacy
An Admission to Candidacy form listing graduate-level courses that apply to the degree must be submitted to the MBA Office four weeks prior to the semester in which the student plans to complete the course work for the degree.

Application for Degree
An Application for Degree form must be submitted to the Graduate School by the published deadline.

Assistantships
A number of assistantships are available each year. In order to be competitive, applications should be submitted by March 15. Additional information is available in the MBA office.

MBA PLUS
Graduate Certificate
The MBA PLUS Graduate Certificate program provides an opportunity for graduates of accredited MBA programs to broaden and update their business education. As business conditions, tools, and techniques change rapidly, a major way of staying at the forefront of knowledge is through additional university education. The MBA PLUS Certificate makes courses in the Belk College’s MBA Concentrations available to persons who already have MBA degrees.

Admission Requirements
Applicants must satisfy the general requirements established by the Graduate School for admission to a graduate certificate program. Applicants must provide two official transcripts indicating the awarding of an MBA degree from an AACSB-accredited institution or equivalent, along with the Graduate application and application fee. (Graduates from the MBA program at UNC Charlotte are not required to send an official transcript.) Applicants will not be required to retake the GMAT.

Completion Requirements
The MBA PLUS Certificate requires completion of twelve or more semester hours of 6000-level courses. At least nine hours must be electives. One 3-hour course may be a repeat of a course previously taken. A student may repeat more courses, but only one such repeated course will be counted toward the certificate. The nine-hour elective requirement of the MBA PLUS corresponds to the nine-hour concentrations in the MBA program.

It is expected that most students will use their twelve hours or more to gain a concentration in a particular functional area of interest. However, a broader program that draws from a number of areas may be pursued.

Transfer credits are not accepted in the MBA PLUS Certificate program. To receive the certificate, students must complete all courses with a grade of “B” or better within four years from the time of enrollment in the first certificate course.

An Application for Graduate Certificate (candidacy form) and an Application for Degree should be completed prior to the last semester of MBA PLUS course work.

COURSES FOR BUSINESS ADMINISTRATION

Undergraduate Preparation Courses for the MBA

ACCT 3200. Foundations of Accounting. (3) Accelerated and in-depth study of conceptual foundations and applications of financial reporting. (Accounting preparation for the MBA. May not be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ACCT 2121-2122.) (Fall, Spring)

BLAW 3200. Legal Environment in Business. (3) Legal environment in which business operates today; legal, social, and ethical considerations of managers within the framework of federal and state regulatory laws; role and function of federal regulatory agencies and their impact on business activities. (Fall, Spring)

ECON 3200. Foundations in Economics. (3) Overview of microeconomic and macroeconomic concepts. Microeconomics: scarcity, opportunity costs, marginal analysis, demand, supply and market structures. Macroeconomics: present values, national income accounting, interest rates, real values versus nominal values, monetary and fiscal policy, balance of payments, and economic growth. (Economics preparation to enter MBA program. Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ECON 2101 - 2102.) (Fall, Spring)

INFO 3200. Foundations in Business Computing. (3) Introduction to computer systems in business with emphasis on the capabilities of computer systems (hardware and software) and skills needed to effectively use computerized decision tools for typical business problems. (Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration.) (Fall, Spring)

OPER 3200. Quantitative Analysis in Business. (3) Quantitative business research methods, information sources, and introduction to management decision making. Either OPER 3200 or satisfactory performance on a proficiency exam covering its content must be fulfilled by all MBA students as part of the preparatory
component. (Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration.) *(Fall, Spring)*

**Graduate Only**

MBAD 5158. Student Managed Investment Fund I. *(3)* Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University’s Endowment Fund. Admission is by permission of instructor. Students selected for the course are required to take MBAD 5159. *(Same as FINN 5158.)* *(Fall)*

MBAD 5159. Student Managed Investment Fund II. *(3)* Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University’s Endowment Fund. Admission is by permission of instructor. Student cannot enroll in this course without successfully completing MBAD 5158. *(Same as FINN 5159.)* *(Spring)*

MBAD 6028. Topics in Business Information Systems. *(3)* Prerequisite: MBAD 6121. Selected topics in information systems. Potential topics include information resource management, database management systems, management support systems, information systems in the financial and banking industry, information systems in manufacturing, information systems in health care, and EDP auditing. May be repeated for additional credit as the topics vary and with permission of MBA director. *(Yearly)*

MBAD 6058. Special Topics in Financial Services. *(3)* Prerequisite: MBAD 6152. Each year, the subject matter of this course deals with a different specialized and contemporary topic of interest to students who are preparing for management careers in the financial services industry. The topics are chosen and covered in a way that builds on and supplements the topics covered in other courses in the Financial Institutions/Commercial Banking concentration. Emphasis is placed on the managerial implications of the subject matter as well as the impact on the financial system. Topics covered in this course may vary from semester to semester, and the course may be repeated a maximum of one time for academic credit. *(On Demand)*

MBAD 6111. Macroeconomics and Business Forecasting. *(3)* Prerequisite: ECON 3200 and OPER 3200 or equivalents. Advanced studies of the interrelations of markets in national and international economies; mechanisms of monetary policy and interest rate effects, foreign exchange rates and inflation; relations between national saving, fiscal policy, the foreign debts and capital investment; short-run and long-run effects of economic policy; tax policy, government spending and economic growth; types of economic forecasts; value and limits of forecasts. *(On Demand)*

MBAD 6112. The Economics of Business Decisions. *(3)* Prerequisites: ECON 3200 and OPER 3200 or equivalents. Economic concepts in the decision-making process. Topics include scarcity; marginal analysis and tools of optimization; demand and supply analysis and market structure; economic efficiency; regression analysis; risk analysis and game theory and international economic issues. *(Fall, Spring)*

MBAD 6121. Business Information Systems. *(3)* Prerequisite: INFO 3200 or equivalent. Examination of how information systems are developed and used in organizations, how information resources are managed, and the potential strategic and competitive impact information systems have in domestic and global business environments. *(Fall)*

MBAD 6122. Technology-Enhanced Decision Making. *(3)* Prerequisite: OPER 3200 or equivalent. An analytical approach to the management process. Generalized models for decision making with major emphasis on application of the scientific method to management problems. *(Yearly)*


MBAD 6124. Business Information Systems Development. *(3)* Prerequisite: MBAD 6121. Examination of managerial issues associated with the study of business processes and the development of supporting information systems. Emphasis on the application of appropriate methodologies, techniques, and tools to analyze, design, and implement business information systems. Study of relevant IS project management and quality assurance techniques. *(Yearly)*

MBAD 6125. Business Data Communications. *(3)* Prerequisites: MBAD 6121. Examination of the information communication requirements of business environments, the fundamentals of communication technology, and the application of the technology for solving business problems. Emphasis on understanding communication technologies to assess needs, plan for the introduction of hardware and software, and manage these communication systems. *(On Demand)*

MBAD 6131. Managerial Accounting. *(3)* Prerequisite: ACCT 3200 or equivalent. Management's use of and need for accounting information, which is necessary for effective managerial decision-making. Emphasis is on understanding managerial accounting information, specifically its purpose, its effect on managerial behavior, and its use in formulating and implementing strategy. Topics include relevant information for activity and
MBAD 6141. Operations Management. (3)
Prerequisite: INFO 3200 and OPER 3200 or equivalents. Design, operation, and control of service and manufacturing systems. Emphasis on using analytical tools for problem solving in process analysis and re-engineering, work-force management, material and inventory management, aggregate planning, total quality management, and others. (Fall, Spring)

MBAD 6142. Quality and Manufacturing Management. (3)
Prerequisite: MBAD 6141. Current issues and advances in operations management including just-in-time inventory management, total quality management, continuous improvement, flexible manufacturing systems, computer integrated manufacturing systems, technology evaluation and selection, and operations strategy. (On demand)

MBAD 6151. Financial Institutions and Markets. (3)
Prerequisite: MBAD 6152. Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as FINN 6151) (Yearly)

MBAD 6152. Financial Management. (3)
Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure and the cost of capital; dividend policy; and leasing. (Same as FINN 6156) (Yearly)

MBAD 6153. Investment Management. (3)
Prerequisite: MBAD 6152. This course focuses on the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as FINN 6151) (Yearly)

MBAD 6154. Applied Business Finance. (3)
Prerequisite: MBAD 6152. Examination of business finance topics which typically confront the firm's primary finance functional areas (CFO, Treasurer, Controller). The purpose is to develop advanced analytical skills in those topic areas. The following topics form the basis of the course: lease vs buy (borrow); leveraged buy-outs; merger analysis (emphasis on valuation); international operations of American firms (capital budgeting and cost of capital); capital structure; risk management. Such additional topics as working capital management; risk management; and relevant current topics will be included as time permits. (Same as FINN 6154) (On demand)

MBAD 6155. Multinational Financial Management. (3)
Prerequisites: MBAD 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as FINN 6155) (Yearly)

MBAD 6156. Commercial Bank Management. (3)
Prerequisite: MBAD 6152. Techniques for the management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as FINN 6156) (Yearly)

MBAD 6157. Theory of Corporate Finance. (3)
Prerequisite: MBAD 6152. This course focuses on the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as FINN 6151) (Yearly)

MBAD 6158. Real Estate Finance and Investment. (3)
Prerequisite: MBAD 6152. This course focuses on the techniques used to analyze, finance and structure real estate transactions. Topics include: an overview of the real estate space and capital markets; the techniques of financial analysis; project ownership, taxation and financial structure; determining the financial feasibility of real estate development; and corporate real estate strategies. (Fall, Spring)

MBAD 6159. Real Estate Development. (3)
Examination of the real estate development process. Identification and evaluation of the critical assumptions and issues related to market and site feasibility, financial feasibility, planning, acquisition, construction, and operation of economically viable commercial real estate projects. (Same as GEOG 6103) (Fall or Spring)

MBAD 6160. Real Estate Capital Markets. (3)
Prerequisite: MBAD 6152. This course focuses on the techniques used to analyze, finance and structure real estate transactions, and emphasizes the role of the capital markets in facilitating development and investment in commercial real estate. Topics include: real estate in an investment portfolio; valuation and investment analysis for direct (private) real estate equity investment including coverage of valuation using real option methodology; primary and secondary commercial mortgage markets (CMBS); and, analysis of publicly traded equity real estate investment trusts (REITs). (Fall, Spring)

MBAD 6161. Organizational Leadership and Behavior I. (3)
Behavioral knowledge and skills essential to becoming an effective manager/leader including behavior and motivation in an environment of complexity and rapid change and ethical implications of actions and
their effects on demographically diverse and increasingly international work force. *(Fall, Spring)*

**MBAD 6162. Organizational Leadership and Behavior II.** *(3)* Prerequisite: MBAD 6161. Continuation of MBAD 6161. Examines performance determinants and appraisal, design of complex organizations, team building, organizational change, career development and conflict management. *(Yearly)*

**MBAD 6163. Human Resource Management.** *(3)* Prerequisite: MBAD 6161. An examination of the current critical issues and strategic questions associated with managing employees. Case material, readings and audiovisual material will be used to stimulate discussion of the most important and strategic questions to be tackled by general managers today and in the future in the relationship between management and workers. *(Yearly)*

**MBAD 6164. Executive Communication** *(3)* Intensive study of communication in organizations from middle and upper management perspectives with special attention to corporate communication, media relations, technologically mediated communication, crisis communication and public affairs. Case studies, readings and project assignments will be used in a variety of business situations. *(Yearly)*

**MBAD 6171. Marketing Management.** *(3)* A managerial approach to strategic marketing decision-making. Topics include promotional strategy, channels of distribution, demand analysis and pricing, and international marketing. Case studies, readings and simulations are used. *(Fall, Spring)*

**MBAD 6172. Marketing Research.** *(3)* Prerequisite: MBAD 6171. Planning, execution and evaluation of marketing research activities. Emphasis on the techniques and methodology used in the collection, analysis and interpretation of economic, demographic and sociological data for use in marketing decision making. *(Yearly)*

**MBAD 6173. Promotional Strategy.** *(3)* Prerequisite: MBAD 6171. Opportunities and challenges for an organization through advertising, personal selling, sales promotion and publicity. It includes analysis of the legal and ethical problems involved in this area. Case studies and a project assignment are used. *(Yearly)*

**MBAD 6174. International Marketing.** *(3)* Prerequisite: MBAD 6171. Study of opportunities, problems and techniques involved in marketing internationally. Analysis of environmental forces which affect international marketing and the methods companies utilize to market effectively on an international scale. *(Yearly)*

**MBAD 6175. Logistics Management.** *(3)* Prerequisite: MBAD 6171. Study of the logistics system as a source of profitability and competitive advantage. Component activities (customer service, inventory, storage, transportation) are examined individually and as parts of a larger whole, with emphasis on effective management of the overall system of finished goods distribution. Special attention is given to managing the transportation function in a deregulated environment. *(Yearly)*

**MBAD 6181. E-Business Concepts.** *(3)* Prerequisite: MBAD 6121. An overview of the business practices and strategies used to compete in the new inter-networked global marketplace. Critical, technical, and managerial issues relating to establishing and maintaining a competitively successful E-Business are explored. *(Fall, Spring)*

**MBAD 6182. E-Business Systems** *(3)* Prerequisites: MBAD 6181 and a programming language such as Visual Basic, C, C++, or Java. A study of the evolving business information systems facilitating electronic commerce. This course provides the basic skills required to develop successful E-Business systems. The course uses hands-on lab sessions, classroom demonstrations, on-line resources, and individual and group projects that include self-learning. *(Spring)*

**MBAD 6183. E-Business Marketing** *(3)* Prerequisites: MBAD 6182 and MBAD 6171. This course integrates marketing analysis and issues with the design and implementation of E-Business marketing programs. Major topics include customer behavior (business to business and business to consumer), marketing strategy (targeting, positioning, and marketing mix) with an emphasis on marketing channels and communications problems/opportunities arising from the application of internet technologies. An E-Business marketing plan will be developed. *(Spring)*

**MBAD 6189. E-Business Strategy** *(3)* Prerequisites: MBAD 6182 and MBAD 6183. E-Business Strategy is designed to integrate the business concepts and environmental issues that are essential for success in today's commercialized Internet setting. The course will consider the opportunities and problems posed by E-Business through the application of analytical models and case studies. This course addresses the changed priorities in strategic management resulting from the emergence of the Internet by emphasizing those strategic management concepts that are not the focus of traditional strategy core classes. *(Capstone in E-Business)*. *(Fall)*

**MBAD 6191. Entrepreneurship.** *(3)* Prerequisites: MBAD 6131, 6152, 6171, or permission of the MBA director. An examination of entrepreneurship and entrepreneurs. Focus on planning the start-up of a fast-growth enterprise with the aim of rewarding the founders and initial investors with significant capital gains. Extensive use of case studies will provide a background of classroom activities to assist students in the preparation of a detailed plan for the hypothetical start-up of a fast-growth firm. *(Yearly)*
MBAD 6192. Business and Society. (3) Ethical, moral, political and social aspects of policy formulation and implementation. Management’s responsibilities to consumers, employees, investor/owners, and society are stressed. Case studies are used. (Yearly)

MBAD 6193. International Business Concepts. (3) Prerequisites: MBAD 6152, 6171, or permission of the MBA director. An overview of international business management. Specifically, the functional areas of business are covered to provide an international perspective. (Yearly)

MBAD 6194. Management Policy. (3) Prerequisite: All courses in the primary and intermediate block of the Functional Component or permission of the Director of the MBA program. Examination of the need to integrate the functional activities of the firm in planning corporate objectives and achieving operating results. Emphasis on ability to identify issues and problems of the firm as a whole, to explore alternatives and to make decisions which recognize the interrelationships of the functional specialties within the total organization. Application and integration of knowledge and skills of analysis developed in the preceding courses of the MBA program. (Fall, Spring)

MBAD 6195. Strategic Management of Technology. (3) Prerequisites: MBAD 6141, 6152, and 6171. Impact of changing technology upon industries and companies and the consequent challenges for business managers. Major topics include: the historical context of change and innovation; organization and innovation; technology and business strategy; impact on functional areas; managing linkages; venturing and organization learning; government influence on innovation; executive leadership; the management of innovation and change. A comprehensive written report covering a significant aspect of emerging technology is required. (On demand)

MBAD 6196. Strategic Planning. (3) Prerequisite: MBAD 6194. Strategic planning within a rapidly changing environment including changing industry conditions as well as technological, social, political and economic changes. Examination of strategic planning techniques being developed by researchers and by corporate practitioners. (On demand)

MBAD 6197. International Business Strategy. (3) Prerequisites: MBAD 6152 and 6171. Management challenges associated with the development of international strategies and the management of organizations in business enterprises whose operations stretch across national boundaries; how multinational enterprises (MNEs) work. Case studies, projects, and presentations are used to help students apply concepts and theories. (On demand)

MBAD 6198. Professional Applications. (3) Prerequisites: Completion of the Functional Component. Team-taught, multidisciplinary course based on (1) structured, written cases and (2) contemporary management problems/issues presented in a non-structured, non-case format. Requires formal written position papers evaluating current business problems which are presented and defended before an audience of peers, faculty members, and business leaders. (On demand)

MBAD 6500. Cooperative Education Experience. (0) Prerequisite: Completion of nine hours of graduate coursework. Participation in the Co-op program enables MBA students to pursue practical work experience that is complementary to their major course of studies. Each student's program must be approved by the director of the MBA program. (Fall, Spring)

MBAD 6890. Directed Individual Study. (3) Directed individual study and in-depth analysis of a special area of management, economics, business or accounting. The course may be used to satisfy up to six semester hours of graduate credit requirements in the Master of Business Administration degree program and may be repeated for credit provided a different area of study is undertaken each time. Permission of a member of the graduate faculty who would direct the study and permission of the MBA director must be secured before registering for the course. (Fall, Spring)

MBAD 7999. Master's Degree Graduate Residence. (1) See Department for more information.

ECONOMICS

Department of Economics
220 Friday Building
704-687-2185
http://www.uncc.edu/colleges/business/economics/MS/ms.htm

Degree
M.S.

Coordinator
John E. Connaughton

Graduate Faculty
L. Ted Amato, Professor
John E. Connaughton, Professor
John M. Gandar, Professor
Hwan Lin, Associate Professor
Gaines H. Liner, Associate Professor
Ronald A. Madsen, Professor
Rob Roy McGregor III, Associate Professor
Benjamin Russo, Associate Professor
Peter M. Schwarz, Professor
Ellen Sewell, Assistant Professor
Jennifer Troyer, Assistant Professor
Program of Study
The Master of Science degree program in Economics features a curriculum that is flexible yet thorough in its approach to theoretical training and applied course work. The program offers concentrations in Economics and in Economics/Finance. Students who complete this program are prepared for staff and management positions that require the integration of economic analysis and advanced quantitative methods. Employment opportunities for economists with a master’s degree exist in both the public and private sectors. In addition, students with a master's degree may choose to pursue additional graduate education leading to a doctoral degree in Economics or in Finance.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Economics:
1) Undergraduate coursework that includes: Calculus, Statistics (or Econometrics), Intermediate Macroeconomic Theory, Intermediate Microeconomic Theory, and Mathematical Economics. (Students missing some of these courses can be admitted conditionally.)
2) A satisfactory score on the aptitude portions of the Graduate Record Examination. The Graduate Management Aptitude Test may be substituted for the GRE with the permission of the program coordinator.

Degree Requirements
The program leading to the Master of Science degree in Economics requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from an accredited institution. (Credit applied toward an awarded graduate degree will not be accepted as transfer credit.) Courses taken at other accredited institutions after enrollment may receive residence credit if approved by the department and the Dean of the Graduate School. All credit hours applied toward the degree must be in courses open only to graduate students. No more than two C's are permitted in the program and at least 18 semester hours must be completed before admission to candidacy. A GPA of at least 3.0 is required to graduate. The program is organized into three curriculum components:
1) a core curriculum in economic theory, econometrics, and forecasting;
2) an individualized curriculum of interrelated coursework; and
3) a research project tailored to the needs of terminal master's students or a thesis for students considering doctoral study in economics.

Admission to Candidacy Requirements
An Admission to Candidacy form listing graduate-level courses that apply to the degree must be submitted to the program coordinator one month prior to the semester in which the student plans to complete the course work for the degree.

Assistantships
A number of graduate assistantships are available each year. To be fully competitive, applications must be submitted by March 15. Further information is available in the Economics Department.

Core Courses
- ECON 6201 Advanced Macroeconomic Theory (3)
- ECON 6202 Advanced Microeconomic Theory (3)
- ECON 6112 Graduate Econometrics (3)
- ECON 6218 Advanced Business and Economic Forecasting (3)

In addition, students who choose to complete a thesis must successfully complete ECON 6999 (Master’s Thesis), while students enrolled in the non-thesis option must complete ECON 6901 and ECON 6902 (Research Methods I and Research Methods II).

Track Descriptions
1) Individualized Curriculum
The purpose of the individualized curriculum is to provide students with the opportunity to acquire specialized theoretical skills related to their areas of interest and expertise. Elective fields of interest could include monetary policy, finance and banking, international trade and international finance, economic analysis for business decision making, urban economics, or economic and business forecasting. The program also permits the development of individualized specializations in areas that are complementary to economic theory and analysis.

2) Economics/Finance Concentration
The Economics/Finance Concentration is designed for students seeking careers in banking or other financial institutions, as well as regulatory bodies dealing with financial markets. The Economics/Finance concentration can also provide an excellent foundation for students who wish to pursue additional graduate study leading to a Ph.D. or D.B.A. degree in Finance.

The Economics/Finance major must complete the core curriculum for the M.S. in Economics and the thesis or research project. In addition, the Economics/Finance major must complete the following:
- FINN 6152 Financial Management (3)
  (Prerequisite: MBAD 6131 or 6 hours of undergraduate accounting and approval of the Graduate Coordinator).
- FINN 6157 Theory of Corporate Finance (3)

One of the following:
- FINN 6151 Financial Institutions and Markets (3)
- FINN 6153 Investment Management (3)
FINN 6155  Multinational Finance (3)
FINN 6156  Commercial Bank Management (3)

Minors
The Department of Economics also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See Operations Research Section of this Catalog for complete information and program requirements.

Advising
Prior to, or concurrent with, the first semester of study, each student will be expected to complete a program of study listing each class the student expects to take as a part of the program.

Thesis
Students may choose the thesis track or the non-thesis option. Students who choose the thesis track must successfully complete ECON 6999 (Master’s Thesis), while students enrolled in the non-thesis option must complete ECON 6901 and ECON 6902 (Research Methods I and Research Methods II).

Application for Degree
An Application for Degree form must be completed and submitted with the graduation fee to the Registrar’s Office by the published deadline.

Tuition Waivers
In-State and Out-of-State Tuition Waivers. A limited number of tuition waivers are made available each year. These waivers are competitively awarded using the same application required for assistantships.

Program Certifications/Accreditations
The Belk College of Business is accredited by the American Association of Collegiate Schools of Business (AACSBB).

COURSES IN ECONOMICS

ECON 5116. Public Sector Economics. (3) Revenue and expenditure problems of governmental units, intergovernmental financial relationships and the impact of federal fiscal policy upon the American economy. (On demand)

ECON 5135. Economics of Development. (3) Theories of economic growth and development applied to varying economic and social systems. Current theoretical models and their relevance to efficient allocation of resources to both the developed and the developing nations. (On demand)

ECON 5160. Economics of Transportation. (3) Analysis of transportation systems. Topics include the historical development of various modes, costs and rate-making, regulation and national transportation policy. (On demand)

ECON 5171. Economics of International Trade. (3) Theory of international trade including determination of international trade patterns, welfare implications of international trade, economic integration, and effects of tariffs and quotas. (On demand)

ECON 5172. Economics of International Finance. (3) Survey of international monetary theory. Topics include exchange rate determination, balance of payments and adjustment, international liquidity, capital movements, international financial organizations, and monetary reform proposals. (On demand)

ECON 5177. History of Economic Thought. (3) History of economics as a science and the evolution of theories of value, distribution and employment. Review of the works of Adam Smith, Thomas Malthus, David Ricardo, Karl Marx, Alfred Marshall, Thorstein Veblen, and John Maynard Keynes. (Spring)

ECON 5180. Industrial Organization and Public Policy. (3) An examination of monopolistic competition, oligopoly, and monopoly and questions of public policy in dealing with problems created by industrial concentration. (On demand)

ECON 5181. Energy and Environmental Economics. (3) Economic issues of both energy and environment. Energy issues include the historical development of energy resources, supply and demand considerations, and projections of the future energy balance. Environmental issues are externality, common property resources, and government regulation. Policy considerations include environmental standards, pollution charges, and property rights. Cost-benefit analysis and microeconomic theory are applied. (On demand)

ECON 6001. Advanced Topics in Macroeconomics. (3) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in macroeconomics. (On demand)

ECON 6002. Advanced Topics in Microeconomics. (3) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in microeconomics. (On demand)

ECON 6090. Topics in Economics. (1-3) Prerequisite: consent of the department. Topics from various areas of economics. Credit hours will vary with the topic offered. May be repeated for credit as topics vary. (On demand)

ECON 6100. Graduate Mathematical Economics. (3) Economic problems are analyzed with quantitative techniques. Topics covered include the study of economic growth models, utility maximization, homogeneous
functions, dynamic systems, applications of linear programming, and constrained optimization. (On demand)

ECON 6112. Graduate Econometrics. (3) Advanced study of the theory and application of statistics to economic problems. Topics include derivation of least-squares estimators; maximum likelihood estimation; and problems of multicollinearity, heteroskedasticity, and autocorrelation. (Fall)

ECON 6120. Economics of Futures and Options Markets. (3) Prerequisites: ECON 6112, 6202. Analysis of futures and options markets. Topics include: theory and application of rational expectations to commodity futures and options, theory and application of economics under uncertainty, statistical behavior of commodity futures and options prices, hedging, regulation of commodity futures markets, and analysis of the success and failure of commodity futures contracts. (On demand)

ECON 6201. Advanced Macroeconomic Theory. (3) Prerequisites: Admission to graduate program. Theories of aggregate income determination, inflation, unemployment, interest rates and economic growth; macro-economic consumption and investment behavior; the business cycle. (Fall)

ECON 6202. Advanced Microeconomic Theory. (3) Prerequisite: Admission to graduate program. Theories of the firm, of the consumer, and of resource owners; determination of prices under different market structures; general equilibrium analysis and welfare economics. (Fall)

ECON 6218. Advanced Business and Economic Forecasting. (3) Prerequisite: ECON 6112. Develops forecasting techniques used in business decision making and techniques used in forecasting macroeconomic variables. Topics include: estimation, identification and prediction using ARMAX, state space, and Box-Jenkins models; spectral analysis; linear filtering. (Spring)

ECON 6235. Monetary and Financial Theory. (3) Prerequisites: ECON 6112 and either ECON 6201 or 6202. Theory and empirical tests of money supply, money demand, and financial markets; portfolio theory with special attention to portfolio choices of banks; term structure of interest rates; dynamic models of money and economic activity. (On demand)

ECON 6240. Economics of International Finance. (3) Prerequisites: ECON 6112, 6201 and 6202. Open economy macroeconomics, international transmission of inflation and unemployment, internal and external balance; balance of payments and international payments mechanisms; determination of exchange rates and effects of hedging and speculation. (On demand)

ECON 6241. Economics of International Trade. (3) Prerequisites: ECON 6112, 6201 and 6202. Examines the causes and consequences of trade using Ricardian and neoclassical models. Considers extensions, modifications, and empirical tests of these models. Analysis of tariffs, quotas, other trade restrictions, export subsidies, and trends in current trade policy. (On demand)

ECON 6250. Advanced Urban and Regional Economics. (3) Prerequisite: Admission to graduate program. Applications of microeconomic theory to problems of cities, metropolitan areas and regions; methods in regional analysis, location theory, land-use planning, measurement of economic activity; transportation, housing, poverty, and growth issues. (Spring)

ECON 6255. Benefit-Cost Analysis. (3) Principles, practices, and applications for defining and comparing the benefits and costs of public policy programs and private sector projects, including techniques useful for organizing and analyzing data, evaluating programs systematically, and developing a framework for decision making while recognizing ethical implications, measurement problems, and time value problems. (On demand)

ECON 6260. Managerial Decision Making. (3) Prerequisites: ECON 6112, 6201 and 6202. Decision making by firms; demand and production functions; relation between cost and production functions; risk analysis. (On demand)

ECON 6800. Directed Study in Economics. (1-3) Prerequisite: Admission to M.S. program in Economics. Independent study of a theoretical and/or a policy problem in a special area of economics. Topics of the investigation may originate from the student or from the faculty member supervising the study. May be repeated for up to 6 hours of credit with the approval of the program coordinator. (On demand)

ECON 6901. Research Methods for Economists I. (3) Prerequisites: ECON 6112, 6201 or MBAD/FINN 6157. Research programs in economics; problem identification; interpretation of statistical results; bibliographic search; data sources and collection; selection of statistical technique; preparation of reports and proposals. (Spring)

ECON 6902. Research Methods for Economists II. (3) Prerequisite: ECON 6901. Critique of economic research and reports, presentation of econometric results and reports. The student will develop a research project, perform statistical tests, and present the results orally and in a major research paper. (Summer)

ECON 6999. Graduate Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. (On demand)
GENERAL GRADUATE COURSES IN BUSINESS

FINANCE

FINN 5158. Student Managed Investment Fund I. (3) 
Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University’s Endowment Fund. Admission is by permission of instructor. Students selected for the course are required to take FINN 5159. (Same as MBAD 5158.) (Fall)

FINN 5159. Student Managed Investment Fund II. (3) 
Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University’s Endowment Fund. Admission is by permission of instructor. Student cannot enroll in this course without successfully completing FINN 5158. (Same as MBAD 5159.) (Spring)

FINN 6058. Special Topics in Financial Services. (3) 
Prerequisite: MBAD 6152. Each year, the subject matter of this course deals with a different specialized and contemporary topic of interest to students who are preparing for management careers in the financial services industry. The topics are chosen and covered in a way that builds on and supplements the topics covered in other courses in the Financial Institutions/Commercial Banking concentration. Emphasis is placed on the managerial implications of the subject matter as well as the impact on the financial system. Topics covered in this course may vary from semester to semester, and the course may be repeated a maximum of one time for academic credit. (Same as MBAD 6160.) (On demand)

FINN 6151. Financial Institutions and Markets. (3) 
Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as MBAD 6151) (Yearly)

FINN 6152. Financial Management. (3) 
Theory and practice of corporate finance including asset management, cost of capital and capital budgeting, optimization problems and socio-economic aspects of financial management. Computer technology may be employed when applicable. (Same as MBAD 6152) (Fall, Spring)

FINN 6153. Investment Management. (3) 
Prerequisite: MBAD 6152. Theory and practice of investment decisions of individuals and fund managers. Topics include the status of capital market theory, the efficient market hypothesis literature, and a portfolio performance measurement. Standard institutional and investment analysis topics, futures and options markets, and international investment topics are covered. (Same as MBAD 6153) (Yearly)

FINN 6154. Applied Business Finance. (3) 
Prerequisite: MBAD 6152. Examination of business finance topics which typically confront the firm’s primary finance functional areas (CFO, Treasurer, Controller). The purpose is to develop advanced analytical skills in those topic areas. The following topics form the basis of the course: lease vs buy (borrow); leveraged buy-outs; merger analysis (emphasis on valuation); international operations of American firms (capital budgeting and cost of capital); capital structure; risk management. Such additional topics as working capital management; risk management; and relevant current topics will be included as time permits. (Same as MBAD 6154) (On demand)

FINN 6155. Multinational Financial Management. (3) 
Prerequisites: MBAD 6111 and 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as MBAD 6155) (Yearly)

FINN 6156. Commercial Bank Management. (3) 
Prerequisite: MBAD 6152. Techniques for the management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as MBAD 6156) (Yearly)

FINN 6157. Theory of Corporate Finance. (3) 
Prerequisite: MBAD 6152. Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure and the cost of capital; dividend policy; and leasing. (Same as MBAD 6157) (Yearly)
At the University of North Carolina at Charlotte, graduate students in the College of Education expand their knowledge and skills and prepare for leadership in their field of study. Programs in general and special education, child and family development, counseling, instructional technology and educational leadership are designed to provide challenging and rewarding educational experiences. Program graduates positively influence their students and peers, contribute to the development of effective schools for all children, and work to alleviate and prevent many of today's educational obstacles. One of the college's most important functions is to serve as a regional resource to help address the challenges of urban schools. Its student body reflects the diversity of the region, with African-American students comprising 18.5 percent of the graduate student population. The college has a strong partnership with the 14 school districts in the region and is located within the bounds of Charlotte-Mecklenburg Schools, the nation's 27th largest school system. All professional education programs are approved for licensure by the North Carolina Department of Public Instruction and are accredited by the National Council for Accreditation of Teacher Education.

Graduate Degree Programs

- Master of Arts in Counseling: Community
- Master of Arts in Counseling: School
- Master of Arts in English Education
- Master of Arts in Mathematics Education
- Master of Education in Curriculum and Supervision
- Master of Education in Instructional Systems Technology
- Master of Education in Child and Family Studies: Early Intervention
- Master of Education in Elementary Education
- Master of Education in Middle Grades and Secondary Education
- Master of Education in Reading, Language, and Literacy
- Master of Education in Teaching English as a Second Language
- Master of Education in Special Education: Academically Gifted
- Master of School Administration
- Ed.D. in Educational Leadership
- Ph.D. in Counseling
- Ph.D. in Special Education

Graduate Non-Degree Programs

- Certificate in Child and Family Development
- Certificate in Curriculum and Supervision
- Certificate in Special Education
- Certificate in Substance Abuse Counseling
- Certificate in Supported Employment and Transition

CHILD AND FAMILY STUDIES: EARLY EDUCATION

Department of Counseling, Special Education, and Child Development
5055 Colvard Building
704-687-2531
http://www.uncc.edu/colleges/education/cspc/main.htm

Degree
M.Ed., Certificate

Coordinator
Dr. Bobbie H. Rowland

Graduate Faculty
Lyn Rhoden, Assistant Professor
Bobbie Rowland, Professor
Bryan Robinson, Professor
Jane Diane Smith, Assistant Professor
JoAnn Springs, Assistant Professor

MASTER OF EDUCATION

The M.Ed. in Child and Family Studies: Early Education prepares professionals for leadership positions that serve young children and their families. It is conveniently designed for prospective students already working full-time in professional settings who wish to pursue an advanced degree on a part-time basis and for those who wish to pursue a degree on a full-time basis. Students specialize in one of five areas of study: classroom teaching, family studies, special needs/special education, administration/supervision, or an individually planned option. The graduate degree program is for professionals who teach in infant, toddler, and preschool and kindergarten settings; who administer preschool and family agency programs that have a child development and family relations focus; who work as consultants, parent educators, program coordinators, supervisors, and staff development trainers; or who seek research and evaluation expertise in child and family studies and community leadership in child and family programs. Graduates will qualify for the Master’s Level “advanced competencies” Birth-Kindergarten (B-K) Teaching License issued by the North Carolina Department of Public Instruction upon completion of the program.
Program Objectives
The M.Ed. degree in Child and Family Studies: Early Education prepares each advanced master’s degree student with skills to:

1) Integrate and apply empirical and theoretical knowledge of the growth and development of typically and atypically developing children.
2) Conduct research on individual and family development and behavior.
3) Employ interdisciplinary approaches to the study of child development, the family, and other social institutions that include the influence of social context and policy variables on children and their families.
4) Take leadership roles in programs that support the development of infant, toddler, preschool, and kindergarten children.
5) Demonstrate advanced knowledge and understanding of interrelationships of families, family dynamics, and children within these contexts.
6) Design and evaluate inclusive learning environments that promote the development of children of various developmental levels and abilities.

Additional Admissions Requirements
In addition to the general requirements for admission to the Graduate School, applicants must hold the “A” level license in Birth-Kindergarten or a closely related field from the North Carolina Department of Public Instruction (or its equivalent in another state). Applicants who do not hold the Birth-Kindergarten teaching license may be required to take additional coursework.

Degree Requirements
The M.Ed. in Child and Family Studies: Early Education requires a total of 39 semester hours of course work, including 18 hours of core courses, 6 hours of applied research/evaluation, 9 hours of thematic electives, and 6 hours of seminar/internship.

Core Courses (18 hours)
CHFD 6102 Learning and Development (3)
CHFD 6200 Curriculum and Learning Environments for Young Children (3)
CHFD 6220 Family Theory, and Research (3)
CHFD 6230 Emerging Literacy and Mathematical Understanding (3)
CHFD 6000 Topics in Child and Family Development (3)

Applied Research/Evaluation (6 hours)
RSCH 6101 Educational Research Methods (3)
CHFD 6900 Research in Child and Family Studies (3)

Thematic Electives (9 hours)
To be selected from the categories of Education of Young Children; Family Studies; Special Needs/Special Education; Administration/Supervision; or individually planned option, with advisor approval.

Internship/Seminar (6 hours)
CHFD 6400 Internship in Child and Family Studies (3)
CHFD 6600 Seminar: Leadership in the Education of Children and Families (3)

Capstone Experiences
Students have the option of completing either an applied master’s project or a research project/thesis related to their specialty area. Either option must be the student’s own design and origination under the supervision of an advisor and graduate committee members.

Admission to Candidacy Requirements
Upon successful completion of a minimum of 24 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which he/she expects to complete all requisites for the degree, a student should file for admission to candidacy on a form supplied by the Graduate School. This application is a check sheet approved by the student’s advisor and graduate coordinator listing all course work to be offered for the degree (including transferred credit and courses in progress).

Assistantships
Each Department in the College of Education funds a limited number of graduate teaching assistantships. Information about these assistantships, including application materials is available in the department office.

Internships
The internship is a supervised, intensive, culminating experience in which students assume a professional role in a child and family development setting and demonstrate the ability to provide direct services, to apply research and theory in a field-based setting, and to assume leadership roles. A minimum of 200 clock hours is required.

Advising
Upon admission, each student is assigned a faculty advisor who helps the student develop his or her program of study and must approve that program of study. Each student must also assemble a graduate committee for consultation and evaluation. Members of the committee include the student’s faculty advisor and at least two other faculty members who represent major areas of concentration in the student’s program.

Licensure
Graduates will qualify for the Master’s Level “advanced competencies” Birth-Kindergarten (B-K) Teaching License issued by the North Carolina Department of Public Instruction upon completion of the program.
Comprehensive Exam
An oral exam may follow the student’s master’s project/thesis completion. The oral exam is designed to provide the student with feedback from the members of the student’s graduate committee about the written project/thesis.

Committees
Students should consult with their academic program advisor in the selection of the committee. The following guidelines are intended to assist the student and his or her academic program advisor in constituting the master’s committee.

A) Chair - selected for content knowledge of the subject area that is selected for the culminating experience. This person may be, but need not be, from your department. It is recommended, however, that this person hold a graduate faculty appointment in your department.

B) Second and third members - selected for knowledge and expertise in the subject area (can be external to your department).

C) Technical advisor - (Thesis and Research Projects only) - selected for technical support (e.g., specialized skills in program evaluation, technical writing, assessment, curriculum design, graphics, ethnography, and survey research methodology). This person may be, but need not be from your department.

D) Additional members - may be added if the committee chair agrees. These members may be from departments of the College other than your department, and may be from other colleges in the University or from outside the University with the prior written permission of the Dean of the Graduate School. (This whole process should start at the beginning of the semester prior to graduation. However, the student may begin anytime after completing 18 hours.)

Master’s Project/Thesis
The nature of the project/thesis is developed by the student in consultation with the major professor and presented to the Advisory Committee for approval. The project is usually something that is practical and will be useful to the student in the professional role that will be assumed upon the completion of the degree. The thesis takes a more research-oriented approach.

Research Opportunities/Experiences
Students have the option of completing either an applied master’s project or a research project/thesis related to their specialty area.

Program Certification/Accreditation
The College of Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the North Carolina Department of Public Instruction (NCDPI) to offer a master’s degree program in Child and Family Studies: Early Education. Graduates will qualify for the Master’s/Advanced Competencies “M” license and prepare them to pursue national certification through the National Board for Professional Teaching Standards (NBPTS).

GRADUATE CERTIFICATE
Child and Family Development

The Graduate Certificate in Child and Family Development: Special Needs is a 12-hour program. The certificate provides students with coursework on services for infants, toddlers, and preschoolers with special needs that is required in order to obtain a North Carolina initial teaching license Birth-Kindergarten (B-K). Course content addresses current issues, service models for young children with disabilities, appropriate assessment, effective early intervention, and building more inclusive environments for young children with disabilities.

Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPED 5111</td>
<td>Issues in Early Intervention: B - K</td>
<td>3</td>
</tr>
<tr>
<td>SPED 5112</td>
<td>Assessment of Young Children with Disabilities: B-K</td>
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<td>SPED 5210</td>
<td>Methods in Early Intervention: B - K</td>
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<td>CHFD 6210</td>
<td>Inclusive Education for Young Children</td>
<td>3</td>
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Admissions Requirements

1) Students must have a bachelor’s degree from a regionally accredited university.

2) Students must provide original transcripts that indicate a minimum overall GPA of at least 2.75 and a junior/senior GPA of at least 3.0.

3) Students are not required to take the GRE or MAT. However, student's wishing to apply Graduate Certificate coursework to the M.Ed. must take the GRE or MAT prior to being admitted to the Child and Family Development graduate program.

4) The twelve (12) hours taken toward a Graduate Certificate may be applied to the advanced master’s degree program in Child and Family Development with the consent of the graduate program coordinator.

5) Admission to the Graduate Certificate program does not ensure admission to the master’s degree program.

COURSES IN CHILD AND FAMILY DEVELOPMENT

CHFD 5000. Topics in Child and Family Development. (1-6) May include classroom and/or clinical experiences in the content area. With department
CHFD 6000. Topics in Child and Family Development. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

CHFD 6100. Adjustment Issues: Children in Family Context. (3) Study of adjustment problems of childhood and adolescence with emphasis on the context and patterns of the family-of-origin system that influence behavior and attitudes as children grow and develop. (On demand)

CHFD 6102. Learning and Development. (3) In-depth study of selected theories of learning and development. (Fall, Spring, Summer) (Evenings)

CHFD 6110. Parenting Education. (3) Prerequisite or corequisite: CHFD 6102. An examination of the principles and practices of parenting education in terms of research, program implementation, evaluation, and collaboration. In-depth study of developmental designs, supportive programs, programs designed to prevent problems, and programs and organizations which respond to parent needs and interests. Emphasis is placed on the process of parent involvement, communication, and collaborative leadership. (On demand)

CHFD 6115. Child and Family Advocacy. (3) Prerequisite: CHFD 6102. Study of the principles and practices of child and family advocacy. (On demand)

CHFD 6120. Creativity, Learning Environments and Experiences. (3) Investigation of theories of creativity and their relationship to curriculum development. (On demand)


CHFD 6200. Curriculum and Learning Environments for Young Children. (3) Prerequisite or corequisite: CHFD 6102. Theoretical and research foundations for designing, implementing, adapting, and evaluating curriculum that is responsive to the needs of young children. Observational strategies are used to assess both the child (individual, sociocultural, and developmental characteristics) and the environment in order to identify best practices. (Spring)

CHFD 6210. Inclusive Education for Young Children. (3). Prerequisite or corequisite: CHFD 6102. Inclusive education provides the opportunity for children with and without developmental disabilities to learn together. Inclusive early childhood curricula and instructional strategies are emphasized as is the professional role of interdisciplinary team member. Legislative mandates for inclusion are studied. (Fall)

CHFD 6220. Family Theory and Research. (3) Prerequisite or corequisite: CHFD 6102. Study of family theories and research which employ the contextual framework of the family as a system and which explain family of origin, family functioning, family structure, and family process. Application of theory and research will include an understanding of the various levels of family functioning as a model for developing family support and intervention plans. (Fall)

CHFD 6230. Emerging Literacy and Mathematical Understanding. (3) Prerequisite or corequisite: CHFD 6102. Emergent development of literacy and mathematical understanding in the home and preschool settings from birth through kindergarten are explored. Language and cognitive development theories and research are linked to home and classroom experiences that enhance literacy and mathematical understanding through developmentally appropriate practices. (Spring)

CHFD 6240. Advanced Studies in Infant and Child Development. (3) Prerequisite: CHFD 6102. An advanced course to extend knowledge of infant and early years development of typically and atypically developing children. Developmental domains of infants and young children and their relationships within family and society will be emphasized. (Fall)

CHFD 6400. Internship in Child and Family Studies. (3) Prerequisite: completion of at least 24 hours of graduate program. Corequisite: CHFD 6600. An intensive, professional supervised internship in which students demonstrate the ability to provide direct service, to apply research and theory in a field-based setting, and to assume leadership roles. A minimum of 200 clock hours is required. (Spring)

CHFD 6600. Seminar: Leadership in Education of Children and Families. (3) Prerequisite: completion of at least 24 hours of graduate program. Corequisite: CHFD 6400. A synthesizing course of study focusing on review, compilation, analysis, and evaluation of the literature, research, and experiences relevant to the student’s specialty area. Students will demonstrate leadership by conducting a program evaluation, creating innovative solutions to challenges, and initiating and creating collaboration among persons and across agencies. (Spring)

CHFD 6800. Individual Study in Child and Family Studies. (1-6) Prerequisite: a written plan of study approved by the student’s advisor and the individual study director. Designed to allow a student to pursue specialty interests under the supervision of an appropriate faculty member. Permission of the student’s advisor and appropriate individual study director. May be repeated for credit. (Fall, Spring, Summer)
CHFD 6900. Research in Child and Family Studies (Master’s Project/Thesis). (3) Prerequisites: RSCH 6101; completion of at least 24 hours of graduate program. Design, implementation, presentation, and evaluation of an approved applied research project in student’s specialty area. The applied project is of the student’s own design under the supervision of an advisor and graduate committee. Graded Pass/No Credit only. (Fall)

Advanced Graduate Only
CHFD 7135. Readings in Learning and Development. (3) Examines research data about the development of human behavior interpreted in terms of multiple disciplines, including psychology, anthropology and ethnology. (On demand)

COUNSELING

Department of Counseling, Special Education, and Child Development
5055 Colvard Building
704-687-2531
http://education.uncc.edu/counseling

Degrees
M.A., Ph.D., Certificate in Substance Abuse Counseling

Coordinators
Dr. Phyllis Post – Program coordinator
Dr. Bob Barret – Doctoral coordinator
Dr. Phyllis Post – Master’s coordinator

Graduate Faculty
Dr. Lyndon Abrams, Assistant Professor
Dr. Bob Barret, Professor
Dr. Carla Bradley, Associate Professor
Dr. Mary T. Burke, Professor
Dr. Jane Carroll, Associate Professor
Dr. Susan Furr, Assistant Professor
Dr. Sylvia Nassar-McMillan, Assistant Professor
Dr. Phyllis Post, Professor

MASTER OF ARTS DEGREE

The M.A. program in Counseling is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP) in both school counseling and community counseling. Both specializations qualify graduates to become Licensed Professional Counselors in North Carolina and for certification eligibility by the National Board of Certified Counselors. The school counseling specialization qualifies graduates for advanced-level K-12 school counseling licensure in North Carolina.

Program Objectives
As prospective professional counselors, graduates of the program are prepared to: counsel clients, both individually and in groups, on educational, career, life planning, social, emotional, physical, spiritual, and organizational concerns; provide information to clients for educational, social, career, and/or life planning; consult with other professionals concerning client needs; and conduct needs assessments, evaluations, and other activities for program design.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the criteria for admission to the M.A. program in Counseling include an applicant’s potential success in forming effective interpersonal relationships in individual and small-group contexts; aptitude for graduate-level study; vocational goals and objectives; openness to self-examination; and potential for personal and professional self-development. Admission decisions are based on applicants’ individual profiles and made by a committee of program faculty. Applicants with the highest profile rankings are invited to campus for a day-long interview process; the number invited is determined by the number of anticipated openings in the program. Students are admitted to the program in the spring of each year, and they are expected to begin their studies the following summer or fall. The application deadline for each year’s admissions process is January 15.

Prerequisite Requirements
Students are not required to have an undergraduate major in any particular field to enter the counseling program.

Degree Requirements
The M.A. program in Counseling requires a total of 60 hours of core courses for all students and specialization courses for students in either school counseling or community counseling. Both specializations include a series of required courses, clinical experience courses and elective courses.

Admission to Candidacy
In addition to meeting Graduate School academic regulations, counseling students should submit a completed Application for Admission to Candidacy when they submit their application for the program’s capstone experience to the Department of Counseling, Special Education, and Child Development.

Core courses for All Students (33 credits):
CHFD 6102 Learning and Development
Or
EDUC 6100 Learning and Development
RSCH 6101 Educational Research Methods
RSCH 6109 Assessment and Evaluation Methods
CSLG 6100 Counseling Theories (FA,SP,SS)
CSLG 6101 Ethics in Counseling (FA,SS)
CSLG 6110 Counseling Techniques (FA,SP)
CSLG 6111 Advanced Techniques (FA,SP, SU)
CSLG 6120 Group Counseling (FA,SP)
CSLG 6121 Structured Groups (FA, SP)
CSLG 6145 Multicultural Counseling (FA, SS)
CSLG 6150 Career and Lifestyle Development (SP,SU)

School specializations courses (27 credits):

Required (3 credits):
    CSLG 7141 School Counseling (SP)

Clinical experiences (two of three must be in a school setting) (9 credits):
    CSLG 7430 Practicum in Counseling (FA,SP) (150 hrs)
    CSLG 7435 Internship (FA,SP) (300 hrs)
    CSLG 7435 Advanced Internship (FA,SP) (300 hrs)

Elective Courses (15 hours). These courses must be approved by the student’s advisor.

Community Specialization courses (27 credits):

Required (6 credits):
    CSLG 7170 Community Counseling and Management (FA)
    PSYC 6153 Classification of Psychological Dysfunctions (SP)

Clinical experiences (two of three should be in a community setting) (12 credits):
    CSLG 7430 Practicum in Counseling (FA,SP) (150 hrs)
    CSLG 7435 Internship (FA,SP) (300 hrs)
    CSLG 7435 Advanced Internship (FA,SP) (300 hrs)

Elective Courses (12 hours). These courses must be approved by the student’s advisor.

Capstone Experience
Students must successfully complete either a written comprehensive examination or a master’s project near the end of their program of study. Students are expected to consult with their advisors during the first 24 hours of course work concerning procedures and preparation for this capstone experience.

Advising
All students should plan their program of study by December of their first year of study with their advisors.

Licensure
Students who graduate from the school counseling track are eligible, upon passing the exam required by the North Carolina Department of Public Instruction (DPI), to be recommended for school counseling licensure from the North Carolina DPI. All graduates are eligible to apply for the credential of Licensed Professional Counselor through the NCBLPC.

Comprehensive Examination
Students must successfully complete either a written comprehensive examination or a master’s project near the end of their program of study.

Program Certifications/Accreditation(s)
The school and community tracks are accredited by the Council for the Accreditation of Counseling and Related Education Programs (CACREP).

DOCTORAL DEGREE
The Ph.D. in Counseling is designed to provide doctoral-level preparation for professionals who seek advanced clinical training and leadership positions in the counseling field. A unique feature of this program is its emphasis on increasing knowledge, awareness, and skills in interacting with socially and culturally diverse populations. Doctoral-level counselors may work as counselor supervisors, direct service providers, counselor educators, program consultants, researchers, program evaluators, and in other roles that require leadership in the areas of human services, family development, community organizations, and counseling. Potential employment settings include schools, hospitals, employee assistance programs, substance abuse treatment centers, community mental health agencies, and private practice centers, as well as institutions of higher education.

The Ph.D. in Counseling requires a minimum of 57 semester hours beyond those earned in an accredited master’s program of at least 48 semester hours. Advanced preparation will be required in the following areas:

1) Implications of ways in which diversity (e.g., race, gender, age, religion, spirituality, ethnicity, mental/physical ability, nationality, and sexual orientation) influence counseling practice and counselor education;
2) Theories pertaining to the principles and practice of counseling, career development, group work, and consultation;
3) Clinical skill development in counseling, group work, and consultation;
4) Theories and practice of counselor supervision;
5) Design and implementation of quantitative research and methodology (e.g., univariate, multivariate, single subject design);
6) Design and implementation of qualitative research and methodology (e.g., grounded theory, ethnography, and phenomenological methodologies);
7) Models and methods of assessment and use of data;
8) Ethical and legal considerations in counselor education and supervision;
9) instructional theory and methods relevant to counselor education.

Additionally, doctoral students will develop a specialization area that increases their professional expertise as counselors (e.g., children, substance abuse, schools, multicultural, sexual minorities, spirituality); they will participate in internship experiences of at least 600 clock hours that may include direct service delivery, teaching, and/or supervision; and they will collaborate with faculty in teaching, supervision, counseling services, research, professional writing, and service to the community, region, and profession.

Program Objectives
Upon completing the doctoral program, students will be able to:
1) acquire, integrate, and apply empirical and theoretical knowledge of the field of counseling;
2) develop leadership skills in counseling, supervision, consultation, and collaboration;
3) apply advanced skills and competencies in field-based settings;
4) conduct research and generate new knowledge in counseling;
5) design, adapt, and evaluate curricula in the field of counseling;
6) examine the influence of social context and policy variables on human behavior;
7) develop depth and breadth in professional growth and continued lifelong learning;
8) show increased sensitivity and clinical skills that demonstrate awareness of the diversity of race, gender, age, religion, ethnicity, mental/physical ability, nationality, and sexual orientation as relevant to counseling professionals.

Additional Admission Requirements
Applicants invited for an on-campus interview will be required to include a 30 minute audio/video tape demonstrating counseling skills. The tape will be accompanied with a signed release from the client, a brief explanation of theoretical orientation, background of the client’s issues and experience in counseling, specific goals of the session, a personal critique of skills demonstrated, and any additional comments the applicant wants to make. The tape is to be submitted in a self addressed envelope so it can be returned following the interview process.

Prerequisite Requirements
Applicants should possess a Master’s Degree in counseling with a cumulative GPA of 3.5 (on a scale of 4.0) or higher. Students with master’s degrees requiring less than 60 semester hours may need to complete prerequisite courses. Two years of experience as a professional counselor preferred.

Degree Requirements and Course Scheduling

Year 1: Fall
CSLG 8100 Advanced Counseling Theories
CSLG 8345 Applied Multicultural Counseling
CSLG 8110 Supervision

Year 1: Spring
CSLG8346 Advanced Multicultural Counseling
CSLG8203 Instructional Theories
CSLG8410 Practicum in Supervision

Year 1: Summer
RSCH8210 Applied Research
Specialization Elective

Year 2: Fall
CSLG8431 Doctoral Practicum
CSLG8998 Prospectus Design
RSCH8110 Statistics 1

Year 2: Spring
Specialization Elective
Specialization Elective
RSCH 8120 Statistics 2

Year 2: Summer
CSLG 8999 Dissertation

Year 3: Fall
CSLG 8440 Internship
CSLG 8999 Dissertation

Year 3: Spring
CSLG 8445 Internship
CSLG 8999 Dissertation

Admission to Candidacy Requirements
Students are considered candidates for the doctoral degree on successful completion of the Preliminary Examination, upon approval of the Petition for Topic Approval and upon submission of the Application for Candidacy.

Assistantships
Graduate Assistantships are available in various offices on campus. Applications must be submitted to individual departments/offices.

Internships
Doctoral students are required to complete a total of 600 clock hours (spread over two semesters) of internship (CSLG 8440). One internship will be devoted to developing clinical skills; the other may be either further clinical development or, for those interested in counselor education as a career, may be directed towards teaching with the Counseling Faculty. Procedures and forms for site selection and registration will parallel those currently
used by the Master’s program in Counseling. Consultation with your advisor at the beginning of the second year of study is essential in this phase of the program.

**Practica**
A Doctoral Practicum is taken in the first two years of study. The practicum requires 10 hours a week at an approved site in the community. Students will provide a minimum of four hours a week of individual counseling and will work under the supervision of a professional at the site and the faculty assigned to the course. Students who want to do a practicum at a site where they are employed must document that the practicum experience is composed of new learning experiences.

**Track Descriptions**
The two internships allow the student to select a focus for their degree. Those who want to become Counselor Educators will do one internship in a clinical setting and one internship assisting the Counseling Program Faculty in teaching. Students who elect a clinical focus will do both of their internships in approved clinical settings.

**Electives**
There are three elective courses in the curriculum. These are most commonly taken within the Counseling curriculum but may be taken in other departments as long as the courses are designated at the 8000 level.

**Advising**
Each student is assigned a faculty advisor when admitted to the program. The advisor assists student during the initial stages of the Program development and through the time at which the student is admitted to candidacy for the doctoral degree. By the end of the student’s first semester the advisor will have assisted the student in developing a proposed program of study that has been approved by the Advisory Committee. The proposed program of study must be approved by and filed with the Doctoral Program Coordinator. Advisors will also assist students in identifying faculty whose research interests and expertise are congruent with the student’s probable area of inquiry for the dissertation. The assistance of the advisor does not relieve the student of responsibility for completing required work and following departmental and university procedures. As students approach candidacy and a concentration area for the dissertation is identified the student may request a change of advisors, and the new advisor will become the Dissertation Committee Chair.

**Qualifying Exam**
The main objective of the written portion of the qualifying exam is to ensure that the student is adequately prepared to write a dissertation to complete the Ph.D. degree requirements. Being prepared means the following:

1) Examinees must be able to analyze and synthesize information obtained from coursework and research within a multicultural counseling context;
2) Examinees must demonstrate advanced knowledge in the core areas of supervision and counseling theory;
3) Examinees must demonstrate competencies in research methodology and evaluation.

The exam will be a 4.5 day take-home exam and will be administered in the first week of each semester.

**Advisory Committee**
No later than midway through the first semester of doctoral studies, the student will form a Doctoral Studies Advisory Committee. The student will use the following procedure:
1) Upon acceptance into the Counseling Doctoral Program students will be assigned an advisor.
2) By the end of the first semester of coursework, the student will form a Doctoral Advisory Committee composed of the assigned advisor and two other faculty members. The advisor will serve as Chair of this committee. The purpose of the Committee is to oversee the student’s course of study, certify that residence requirements have been met, supervise the Qualifying Exam, and other duties as determined by the Counseling Program.
3) Prior to registration for the second semester, the student will set up a meeting with the Doctoral Advisory Committee to plan the course of study, the “blueprint” from which students will operate to prepare for admission to doctoral candidacy. It is the student’s responsibility to arrange a meeting of this committee.
4) After the student is admitted to candidacy, this committee will be dissolved. At the student’s request and the faculty’s approval the new Doctoral Dissertation Committee may contain the same members as the Doctoral Advisory Committee.
5) An additional member of the Dissertation Committee will be appointed by the Dean of the Graduate School.

**Dissertation Committee**
A Dissertation Committee comprised of at least five faculty members will be formally appointed for each student after admission to candidacy. At least three committee members must be on the Counseling Program faculty and one member will be appointed by the Graduate School. A person outside the university may serve as a full member of the Dissertation Committee in situations where knowledge or expertise of a particular nature is desired. Faculty who serve on the Dissertation Committee must be recommended by the Doctoral Program Coordinator and appointed by the Department Chair. Each appointed Committee Member will have both voice and vote on all relevant matters pertaining to a doctoral student’s progress towards the degree. At least four committee members must be present for the oral defense of the dissertation. The oral defense is considered satisfactory upon the positive vote of at least four
committee members. Prior to and following the appointment of this committee students are encouraged to work with faculty on dissertation ideas.

**Dissertation**

Each candidate for the doctoral degree is required to prepare and present a dissertation that shows independent investigation and is acceptable in form and content to the Dissertation Committee. A doctoral dissertation must demonstrate the candidate’s ability to conceive, design, conduct, and interpret independent, original, and creative research and must make a unique contribution to knowledge in the field of counseling. Under the direct supervision of the Doctoral Committee Chair, students are encouraged to consult regularly with their Dissertation Committee members during the planning, conducting and writing of the dissertation. Following the approval of the dissertation proposal students are required to maintain continuous enrollment (fall and spring semesters) for dissertation study until work is completed. Continuous enrollment begins on the date the Graduate School approves the student’s dissertation topic. Students who exceed the required number of hours for degree completion will register for CSLG 8999 for three credits each semester until degree requirements have been completed.

**Financial Aid/Financial Assistance**

There is limited financial aid available in the form of grants and tuition waivers. The exact amount of funds available for any given year varies.

**Program Certifications/Accreditation(s)**

The program will be considered for accreditation by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP) in 2003-04.

**CERTIFICATE**

**Substance Abuse Counseling**

A curriculum has been established for a specialty in substance abuse counseling. The four courses CSLG 6160/8160: Theories of Chemical Dependence; CSLG 6161/8161: Chemical Dependence: Assessment and Diagnosis; CSLG 6162/8162: Chemical Dependence: Counseling Individuals, Families, and Groups; CSLG 6163/8163: and Chemical Dependence: Treatment Planning and Relapse Prevention compose a specialty in substance abuse counseling. These four courses plus 600 hours of supervised field experiences in substance abuse treatment facilities are components of a university-approved certificate program. Students who successfully complete the four courses are exempt from the written portion of the NC certification exam for substance abuse counseling.

**COURSES IN COUNSELING**

**CSLG 6000. Topics in Counseling.** (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

**CSLG 6100. Counseling Theories.** (3) Examination of the counseling relationship from various theoretical frameworks, including client-centered, psychoanalytic, Gestalt, transactional analysis, rational emotive, reality, and behavior theories. (Fall, Summer)

**CSLG 6101. Ethical and Professional Issues In Counseling.** (3) Ethical and legal responsibilities, ethical standards, interpretations of laws by local authorities, and court decisions that impact the counseling profession. Skills of practical, ethical, and legal consultation are also emphasized. (Fall, Summer)

**CSLG 6109. Research in Counseling.** (3) Examination of principles and practices for research and development of programs in counseling with emphasis on developmental designs, preventive programs, objectives and organizations. (On demand)

**CSLG 6110. Counseling Techniques.** (3) Examination of concepts of individual counseling and the means for establishing facilitative relationships including competence in basic counseling skills and interventions. (Fall, Spring)

**CSLG 6111. Advanced Counseling Techniques.** (3) Prerequisites: CSLG 6100, 6110 and 7430. Counseling interventions useful in facilitating client change and growth from an action-oriented, problem management perspective. Strategies for cognitive, affective, and behavioral change will be practiced. (Fall, Spring, Summer)

**CSLG 6115. Person-to-Person Relationships.** (3) Examination of concepts and methods for improving human relationships. This course has an experiential component. (On demand)

**CSLG 6120. Group Counseling.** (3) Investigation of concepts of group counseling and the means for developing facilitative interaction in groups which will include an experiential component as a major learning activity. (Fall, Spring)

**CSLG 6121. The Leadership and Design of Structured Groups.** (3) Methods of creating psychoeducational groups. Focus on applying psychological theories to the selection of group content. Leadership issues such as screening, dealing with difficult members, and leader roles are addressed. (Fall, Spring)

**CSLG 6145. Multicultural Counseling.** (3) Approaches to counseling that focus on multicultural differences so
the counselor will be more effective in dealing with clients from a variety of cultural backgrounds. *(Fall, Summer)*

**CSLG 6150. Career and Lifestyle Development.** *(3)* A counseling-oriented course designed to help the counselor and/or career education teacher develop the ability to use career information with emphasis on understanding of occupational information, systems of collection and usage forms. *(Spring, Summer)*

**CSLG 6152. Approaches to Career Development (K-12).** *(3)* Counselors and vocational development coordinators gain an understanding and skills necessary for (1) the development, management and evaluation of a comprehensive, competency-based K-12 career education/ counseling program, (2) infusing career education into K-12 curriculum in a counselor/consultant capacity, and (3) establishing and leading successful individual and group career development activities. *(On demand)*

**CSLG 6160. Theories of Chemical Dependence.** *(3)*. Introduction to the theoretical, philosophical, and historical premises upon which chemical dependence is explained and treatment and prevention are based. Biological, psychological, and sociological etiologies of substance abuse and dependence are studied. *(Alternate Fall, Even years)*

**CSLG 6161. Assessment and Diagnosis of Chemical Dependence.** *(3)*. Process and procedures for professional biopsychosocial assessment and diagnosis of substance abuse and dependence in adolescents and adults are studied. Implications of chemical dependence for clients and their families are addressed. *(Alternate Spring, Odd years)*

**CSLG 6162. Chemical Dependency: Counseling Individuals, Families, and Groups.** *(3)* A counseling techniques course designed to help students who have worked as professional substance abuse counselors and those who have little or no experience working with substance dependent individuals and their families. *(Alternate Fall, Odd years)*

**CSLG 6163. Chemical Dependency: Treatment Planning and Relapse Prevention.** *(3)* An introduction to the principles and practices upon which chemical dependence treatment and relapse prevention are based. Computerized programs will be used to aid students in assessment, diagnosis, and in planning treatment for chemically dependent clients. *(Alternate Spring, Even years)*

**CSLG 6200. Introduction to Theories of Family Counseling.** *(3)* Examination of appropriate interventions in working with families focusing on major theorists and techniques in the field. *(On demand)*

**CSLG 6201. Counseling Needs of Women.** *(3)* Women’s development and needs, the problems they bring to counselors, strategies for helping with them, myths about women and biases in psychological research. *(On demand)*

**CSLG 6800. Individual Study in Counseling.** *(1-6)* Prerequisite: Permission of the student’s adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

**CSLG 7110. Individual Assessment.** *(3)* Prerequisite: RSCH 6109 or PSYC 4140. Examination of the major aptitude, intelligence and other psychological tests commonly used in counseling with emphasis on test theory as well as the administration, scoring and interpretation of tests and the communication of their results. *(On demand)*

**CSLG 7120. Administration and Supervision of Counseling Services.** *(3)* Planning, operation, implementation and supervision of counseling and guidance services in schools and agencies with emphasis on the development of administrative and supervisory skills. *(On demand)*

**CSLG 7140. Elementary School Counseling and Guidance.** *(3)* Introduction to the guidance function in the elementary school with emphasis on the counselor’s role in counseling, consulting and coordinating school and community resources for the optimum benefit of the child. *(On demand)*

**CSLG 7141. The School Counselor.** *(3)* Development of functional skills necessary for integration of counseling activities into school curriculum. Focus on the role of the counselor in counseling individuals, small group counseling, classroom guidance, consultation, program design, coordinating school and community resources, and administration of special programs. *(Spring)*

**CSLG 7142. Introduction to Play Therapy.** *(3)* Examination of concepts of play therapy and the means for establishing facilitative relationship with children under the age of ten years. *(On demand)*

**CSLG 7143. Advanced Play Therapy: Extending the Skills.** *(3)* Prerequisite: CSLG 7142. Focuses on advanced play therapy skills and introduces concepts and skills for training parents/teachers to be therapeutic agents in their children’s lives through the utilization of play therapy skills. *(Alternate Fall, Even years)*

**CSLG 7151. Approaches to Adult Career Development.** *(3)* Prerequisite: CSLG 6150. For the career development specialist who needs to survey an environment in which adults are seeking career counseling; assess needs; develop interventions strategies to meet needs; and assess outcomes. *(On demand)*
CSLG 7153. Research Techniques and Computer Applications in Career Counseling. (3) Prerequisites: RSCH 6101, 6109 and 6110. Skills in preparing a literature review upon which to base a research study; critiquing theoretical, philosophical, and research material and reports; and conducting and reporting a research study. Focus on understanding the effective application of computer technology to the provision of career-related services in mental health, education, rehabilitative or other human services settings. (Fall, Spring)

CSLG 7160. Solution-Focused Brief Therapy. (3) Prerequisites: CSLG 6110; CSLG 6100; CSLG 7430. An introduction to counseling in a time-limited manner while helping clients understand how they maintain their problems and how to construct solutions.

CSLG 7170. Community Counseling and Management. (3) Counseling in community agency settings, including the roles and functions of a professional counselor, assessing the needs of an agency population and the interworkings of various agencies and agency networks. (Fall)

CSLG 7190. Introduction to Pastoral Counseling. (3) Prerequisites: CSLG 6100, 6110. Introduction to the field of pastoral counseling including both theological and counseling dimensions. (On demand)

CSLG 7191. Advanced Issues in Pastoral Counseling. (3) Prerequisite: CSLG 7190. Specific content relevant to pastoral counseling including didactic and experiential foci. (On demand)

CSLG 7205. Techniques of Family Counseling. (3) Prerequisites: CSLG 6100, 6200. An overview of techniques used by family counselors working from communications, structural or strategic orientations. (On demand)

CSLG 7430. Practicum in Counseling and Guidance. (3) Prerequisites: CSLG 6100, 6101, 6110, 6200, and 7142 if working in an elementary school setting. Supervision of individual and group counseling interventions conducted in field settings; special attention to the development of evaluative criteria for self and peer assessment. A minimum of 10 hours per week in field placement. Offered on a pass/no credit basis. May be repeated once for credit with departmental approval. (Fall, Spring)

CSLG 7435. Internship in Counseling. (3) Prerequisite: CSLG 7430 and 7142 if working in an elementary school setting. Students will participate in delivering counseling services in a field setting and receive supervision of their work in weekly seminars. A minimum of 20 hours per week in field placement. Offered on a pass/no credit basis. (Fall, Spring)

CSLG 7436. Advanced Internship. (3) Prerequisite: CSLG 7435. Continuation of CSLG 7435. Students will function as counselors in field settings and have the opportunity to demonstrate advanced level skills in weekly seminars. A minimum of 20 hours per week in field placement. (Fall, Spring)

CSLG 7600. Sexual Orientation Diversity in Clinical Practice. (3) The course considers the experience of being gay, lesbian, bisexual or transgendered in our society. Theoretical understandings of sexual orientation are covered, as well as the impact of societal prejudice on gay, lesbian, bisexual and transgendered individuals and their communities. The experience of diversity with such communities is discussed, especially racial/ethnic diversity. Exploration of individual values combines with an emphasis on clinical practice to make this course relevant both personally and professionally.

CSLG 7601. Counseling: The Spiritual Dimension. (3) This course is designed to assist counselors in understanding and facilitating the development of their personal spirituality as well as the spirituality of others with whom they provide counseling services. Spirituality is viewed as an important component to achieving mental health and to a balanced sense of wellness. Basic beliefs and various spiritual systems including major world religions will be examined.

CSLG 7644. Theory and Practice of Play Therapy. (3) An advanced exploration of fundamental issues involved in play therapy, this seminar course will focus on an in-depth study of various theoretical approaches underlying the practice of play therapy. Historical and theoretical foundations of play therapy are presented as are current issues in providing appropriate counseling services to children aged two to ten years old.

CSLG 7645. Cognitive-Behavior Theory and Practice. (3) An introduction to the theory and practice of cognitive-behavior therapy that can be applied in the school setting. The major theories (cognitive therapy, cognitive-behavior modification, REBT, and reality therapy) will be examined, and treatment planning and application of techniques will be studied.

CSLG 7646. Administration and Leadership of School Counseling Services. (3) This course will focus on the organization, planning, management, and evaluation of school counseling programs. Current issues impacting school counselors will be explored and intervention strategies will be examined.

CSLG 7680. Crisis Counseling. (3) This course will focus on a general crisis intervention model and its application to specific crisis situations. Topics include: suicide intervention, rape crisis, telephone counseling, and disaster intervention.

CSLG 7681. Grief and Loss Counseling. (3) This course examines the theory of loss, the tasks involved in grieving, and the skills needed by a counselor working
CSLG 7800. Individual Study in Counseling. (1-6)
Prerequisite of the student’s advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

CSLG 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during completion of capstone project or comprehensive examination. (Fall, Spring)

CSLG 8000. Topics in Counseling. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

CSLG 8100. Advanced Counseling Theory Seminar. (3) The principles and practices of traditional and more current counseling theories are studied. Students will examine the rationale and consequences of their pre-conceived notions about conditions that influence human behavior and change. Students will develop their own theory of counseling.

CSLG 8105. Seminar in Research in Counseling. (3) This course focuses on exploring the outcome research in counseling and career development, as well as the variables that influence the counseling process. Special focus will be on developing areas of personal expertise, developing research theses, and writing critical literature reviews.

CSLG 8110. Clinical Supervision in Counseling. (3) This course provides a critical overview of the conceptual and empirical literature on counseling supervision, including models, approaches/techniques, relationship and process issues, and ethical and legal considerations. Students will develop conceptual knowledge, skills, and self-awareness concerning these topics through readings, seminar discussions, and application via supervising master’s level students.

CSLG 8111 Solution-Focused Brief Therapy. (3) Prerequisites: CSLG 6110; CSLG 6100; CSLG 7430. An introduction to counseling in a time-limited manner while helping clients understand how they maintain their problems and how to construct solutions.

CSLG 8142. Introduction to Play Therapy. (3) Prerequisite: None. Corequisite: None. Examination of concepts of play therapy and the means for establishing facilitative relationship with children under the age of ten years. (On demand)

CSLG 8143. Advanced Play Therapy: Extending the Skills. (3) Prerequisite: CSLG 7142. Corequisite: None. Introduces concepts and skills for training parents to be therapeutic agents in their children’s lives through the utilization of play therapy skills. (Alternate Fall, Even years)

CSLG 8160. Theories of Chemical Dependence. (3). Introduction to the theoretical, philosophical, and historical premises upon which chemical dependence is explained and treatment and prevention are based. Biological, psychological, and sociological etiologies of substance abuse and dependence are studied. (Alternate Fall, Even years)

CSLG 8161. Assessment and Diagnosis of Chemical Dependency. (3) Process and procedures for professional biopsychosocial assessment and diagnosis of substance abuse and dependence in adolescents and adults are studied. Implications of chemical dependence for clients and their families are addressed. (Alternate Spring, Odd years)

CSLG 8162 Chemical Dependency: Counseling Individuals, Families, and Groups. (3) A counseling techniques course designed to help students who have worked as professional substance abuse counselors and those who have little or no experience working with substance dependent individuals and their families. (Alternate Fall, Odd years)

CSLG 8163 Chemical Dependency: Treatment Planning and Relapse Prevention. (3) An introduction to the principles and practices upon which chemical dependence treatment and relapse prevention are based. Computerized programs will be used to aid students in assessment, diagnosis, and in planning treatment for chemically dependent clients (3) (Alternate Spring, Even years)

CSLG 8200. Introduction to Theories of Family Counseling. (3) Examination of appropriate interventions in working with families focusing on major theorists and techniques in the field. (On demand)

CSLG 8201. Counseling Needs of Women. (3) Women’s development and needs, the problems they bring to counselors, strategies for helping with them, myths about women and biases in psychological research. (On demand)

CSLG 8203. Instructional Theory in Counselor Education. (3) This course will prepare the student to become a professor in counselor education. An examination of the theories and methods of teaching in higher education will be explored. Readings from professional journals, lecture, discussion, and practical application in the classroom will be used to meet course objectives.

CSLG 8345. Advanced Multicultural Counseling. (3) An advanced exploration of fundamental issues involved in culturally competent counseling, this seminar course will focus on an in-depth study of various cultures.
seeking counseling services. Students will examine various oppression models and have an opportunity to apply them to cultures in our community.

CSLG 8346. Applied Multicultural Counseling. (3) This course focuses on the impact of oppression on the daily lives of marginalized groups. Students conduct extensive field-based investigations into various cultures in order to gain mastery-level knowledge of the practical day-to-day experiences especially as they involve accessing mental health services. Special focus will be on counseling applications that are appropriate within and between cultures. Learning to utilize systems interventions and the mastering the skills of consultation are key components of this course.

CSLG 8410. Practicum in Clinical Supervision. (3) This course will provide students with the practical experiences necessary to provide individual supervision of counselors, including field supervision and analyses of counseling audio and videotapes. Students will have the opportunity to test their conceptual knowledge, skill, and self-awareness developed through prerequisite coursework.

CSLG 8431. Doctoral Practicum in Counseling. (3) Practicum is an applied course where students will develop and/or refine their counseling skills. These skills will be conceptually linked counselor education and supervision. Working in sites throughout the community, students will produce audio and/or video tapes of individual and group counseling practice for supervision.

CSLG 8440. Internship I. (3) Student will deliver counseling services in a field setting and receive individual and group supervision of their work weekly. A minimum of 300 clock hours is required. (Fall, Spring)

CSLG 8445. Internship II. (3) Students will participate in 300 hours internship experience in field settings that are appropriate to their career objectives under the supervision of a University program faculty member.

CSLG 8600. Sexual Orientation Diversity in Clinical Practice. (3) The course considers the experience of being gay, lesbian, bisexual or transgendered in our society. Theoretical understandings of sexual orientation are covered, as well as the impact of societal prejudice on gay, lesbian, bisexual and transgendered individuals and their communities. The experience of diversity with such communities is discussed, especially racial/ethnic diversity. Exploration of individual values combines with an emphasis on clinical practice to make this course relevant both personally and professionally.

CSLG 8601. Counseling: The Spiritual Dimension. (3) This course is designed to assist counselors in understanding and facilitating the development of their personal spirituality as well as the spirituality of others with whom they provide counseling services. Spirituality is viewed as an important component to achieving mental health and to a balanced sense of wellness. Basic beliefs and various spiritual systems including major world religions will be examined.

CSLG 8604. Counseling Sexual Minority Families and Couples. (3) This course will focus on the unique challenges facing the counselor who is providing clinical services to gay, lesbian, bisexual and transgendered families and couples. Topics include the impact of oppression on primary relationships, the political implications of sexual minority relationships, relationship models, parenting, and interacting with the outside world.

CSLG 8644. Theory and Practice of Play Therapy. (3) An advanced exploration of fundamental issues involved in play therapy, this seminar course will focus on an in-depth study of various theoretical approaches underlying the practice of play therapy. Historical and theoretical foundations of play therapy are presented as are current issues in providing appropriate counseling services to children aged two to ten years old.

CSLG 8645. Cognitive-Behavior Theory and Practice. (3) An introduction to the theory and practice of cognitive-behavior therapy that can be applied in the school setting. The major theories (cognitive therapy, cognitive behavior modification, REBT, and reality therapy) will be examined, and treatment planning and application of techniques will be studied.

CSLG 8646. Administration and Leadership of School Counseling Services. (3) This course will focus on the organization, planning, management, and evaluation of school counseling programs. Current issues impacting school counselors will be explored and intervention strategies will be examined.

CSLG 8680. Crisis Counseling. (3) This course will focus on a general crisis intervention model and its application to specific crisis situations. Topics include: suicide intervention, rape crisis, telephone counseling, and disaster intervention.

CSLG 8681. Grief and Loss Counseling. (3) This course examines the theory of loss, the tasks involved in grieving, and the skills needed by a counselor working with grief and loss issues. Loss will be examined from a broad perspective and includes issues associated with death, loss of relationships, and loss of abilities.

CSLG 8800. Individual Study in Counseling. (1-6) Prerequisite of the student’s advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

CSLG 8998. Seminar in Prospectus Design. (3) This course will provide students the opportunity to identify and define a research area of inquiry and develop a proposal draft for the dissertation study. Students will be
expected to select, plan and outline an original research study appropriate for the dissertation requirement.

**CSLG 8999. Dissertation. (9)** Under the direction of a dissertation advisor and committee, the student is expected to design and execute an original research study. This study should address a significant issue or problem related to counseling or counselor education. (*Fall, Spring, Summer*)

**CSLG 9999. Graduate Residence. (1)** Meets Graduate School requirement for continuous enrollment. (*Fall, Spring*)

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**CURRICULUM AND SUPERVISION**

**Educational Administration: Curriculum Leadership**

**Department of Educational Leadership**
Chair, Dr. J. Allen Queen  
3123 Colvard Building  
704-687-4717  
http://www.uncc.edu/colleges/education/eart/

**Degree**
M.Ed., Certificate

**Coordinator**
Dr. Corey Lock

**Graduate Faculty**
Professors  
Carl Ashbaugh  
James Lyons  
J. Allen Queen

The M.Ed. in Curriculum and Supervision is designed to prepare highly competent program leaders for the school systems of North Carolina. UNC Charlotte is particularly dedicated to serving the 23 school districts located in the Southwestern Piedmont area of the state. To achieve its objectives, the program is designed to attract high-quality students and help them develop specific competencies to enable them to define, communicate, interpret, and assess teachers in the implementation of state and local curricula.

**Program Objectives**
The major educational objectives of the program are to develop instructional leaders who have advanced knowledge and skills in curriculum development and supervisory practices to assist the school system by:

1) Guiding principals and teachers in the interpretation of curriculum standards and specific competencies for instructional development.

2) Directing teachers in curriculum and instructional alignment to maximize success for the highest levels of student achievement possible.

3) Promoting the expectations that effective teachers are masters of their subject content, highly knowledgeable of human dynamics, directly responsive to individual differences in students and well accomplished in the art and science of pedagogy and student assessment.

4) Encouraging participants in the program to self-direct their personal and professional growth as educators by:
   - Taking responsibility for their own learning;
   - Initiating professional inquiry through conversations with colleagues;
   - Critically reading the professional literature;
   - Participating voluntarily in personal and professional development opportunities; and
   - Setting high expectations for their professional performance.

5) Guiding participants to promote in teachers the skills to respond effectively to children's differences as influenced by development, exceptionalities, and diversity by:
   - Developing and advanced understanding of human development;
   - Expecting and respecting differences among children that are influenced by development, exceptionalities, and diversity;
   - Promoting understanding and respect for all members of the classroom community;
   - Helping students, parents, and colleagues develop a global perspective; and
   - Applying their knowledge at all levels of interaction with students: from modifying instruction for individuals to creating classrooms where all students feel welcome and can be successful learners.

6) Demonstrating advanced knowledge of the content and pedagogy in curriculum and supervision by:
   - Demonstrating advanced knowledge of the range of appropriate content;
   - Helping children to acquire the knowledge and skills appropriate for specific grade levels and development through many effective instructional and assessment practices;
   - Using technology in a variety of ways to support learning;
   - Helping students develop competencies applicable across the curriculum; and
   - Helping children make sense of their learning by connecting school content and students' lives outside of school and by integrating curriculum.

7) Improving educational practice through self-reflection, self-evaluation, and applied research by:
   - Engaging in study that leads to continuous improvement of teaching and learning;
   - Actively investigating and solving educational problems through data gathering and assessment;
c) Continuously monitoring the learning problems and successes of each learner;

d) Making appropriate adjustments in both instruction and learning environments based on analysis of data; and

e) Regularly monitoring the effects of their actions on academic achievement.

8) Serving as educational leaders by:

a) Actively participating as leaders in areas in which they can contribute to solving educational problems, such as School Advisory Teams and committees in professional organizations;

b) Taking responsibility for sharing in decision-making relative to school-wide and/or system-wide issues;

c) Readily asking for and sharing successful instructional approaches and solutions with colleagues, supervisors, and educational leaders; and

d) Providing mentoring for colleagues.

The Program

Today, curriculum specialist and instructional supervisors must be able to elicit support and create program structures and climates that foster the kinds of creativity, change, and innovation that will educate the most diversified group of children ever in America's schools. To meet this challenge, the M.Ed. program focuses on curriculum development. It enables students to develop specific competencies related to curriculum leadership, instructional practice and supervisory roles. It emphasizes performance and competence in school-based leadership and the overall quality of K-12 instruction.

The M.Ed. program provides for 33 credits of classroom study followed by an internship. In the cohort, a part-time student can complete the program in two years. Students average two courses per semester while the final six credit hours of each student's program are in the internship and a seminar. The internship semester is undertaken on a full-time basis. The program faculty will work with students and school districts to arrange for the internships to be completed with minimum impact on their current positions.

General Curriculum Plan

The 39 semester-hour M.Ed. program includes nine hours of professional education core courses and 30 hours of course work in curriculum and educational administration and leadership (including academic experience in internships and seminars).

Professional Education Core Courses (9)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIST 6101</td>
<td>The Adult Learner</td>
</tr>
<tr>
<td>RSCH 6101</td>
<td>Educational Research Methods</td>
</tr>
<tr>
<td>ADMN 6100</td>
<td>Fundamentals of Educational Leadership*</td>
</tr>
</tbody>
</table>

Core Courses in Educational Administration and Leadership (24)

- CURR 6122 Curriculum Development*
- CURR 6356 Curriculum Studies*
- ADMN 6105 Legal Aspects of Schooling
- ADMN 6120 Instructional Leadership
- ADMN 6121 Strategies and Designs in Curriculum*
- ADMN 6125 Advanced Instructional Techniques
- ADMN 6130 Supervision of Instruction*
- A course in Curriculum Assessment and Evaluation

Internship/Seminars (6)

- ADMN 6601 Seminar in Supervision
- ADMN 6491 Internship and Seminar: Supervision*

*These six courses are required for the Certificate in Curriculum and Supervision. See Certificate section below.

Additional Admissions Requirements

In order to be considered for admission to the M.Ed. program, applicants are expected to submit the following materials to the Graduate Admissions Office:

1) A written application;
2) Evidence of a bachelor's degree or its equivalent from an accredited institution with an overall GPA of at least 3.00;
3) Two official transcripts of previous academic work attempted beyond high school;
4) A score of 50th percentile or higher on the Graduate Record Examination or the Miller Analogies test taken within the previous five years;
5) Three professional recommendations;
6) A description of previous relevant employment, including evidence of at least three years of successful teaching experience in K-12;
7) Evidence of state licensure as a classroom teacher; and
8) A personal statement of purpose or intent for entering the program.

Applications to the program will be accepted in the spring for admission the following fall semester. The process is designed to ensure selection of a highly competent and diverse cohort of students. The number admitted each year will be based on current resources, but it is expected to be approximately 20 full-time students admitted for the program. Upon successful completion of the program and Praxis examination, graduates will receive a recommendation for North Carolina licensure as a Curriculum-Instructional Specialist.

Certificate in Curriculum and Supervision

The Graduate Certificate in Curriculum and Supervision provides an opportunity for educators who already hold a master's degree to complete a graduate program that leads to licensure as a Curriculum Instruction Specialist. The program requires completion of 18 hours of course work (see * above). Since the program leads to state licensure, there are no electives or transfer credits permitted.
COURSES IN CURRICULUM AND SUPERVISION

CURR 6122. Curriculum Development. (3) Planning, development and evaluation of curricular programs. (On demand)

CURR 6356. Curriculum Studies. (3) Examination of the field of curriculum study with particular emphasis on the change process. (Fall, Spring, Summer, Evenings)

See description of ADMN courses in Educational Administration section.

EDUCATIONAL ADMINISTRATION
Educational Administration: Principalship

Department of Educational Leadership
Chair, J. Allen Queen
3123 Colvard Building
704-687-4717
http://www.uncc.edu/colleges/education/eart/

Degree
M.S.A.

Coordinator
Dr. Glenda Poole

Graduate Faculty
Professors
Carl Ashbaugh
John Gretes
Jim Lyons
J. Allen Queen

Assistant Professors
Louise Allen
Glenda Poole

Program of Study
The Master of School Administration (M.S.A) program is designed to prepare individuals who can serve as building principals and curriculum and instructional specialists in K-12 schools. This program qualifies graduates for both a Level I license as a K-12 School Administrator: Principal and a Level I license as a K-12 Curriculum Instructional Specialist: Supervisor.

Program Objectives
As prospective school principals, graduates of the program are prepared to: demonstrate an understanding of the purpose, mission, goals, objectives, and operating procedures of schools; plan educational programs and activities; acquire and manage resources for instruction in a school; assess educational programs and personnel; facilitate group cohesiveness, staff cooperation and motivation, problem solving, decision-making, and the resolution of organizational, group, and individual conflict; exercise collaborative leadership in working with diverse groups and representing staff, students, parents, school officials, and the public; improve staff members’ work experiences, enhance their self-confidence, and contribute to their professional development; deal with the dynamics of change, including timing, direction, strategies, and preparation of an organization and its staff; and demonstrate an understanding of how legal, social, economic, technological, and political environments affect schools and the education of children.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, applicants must have a minimum of three years successful teaching experience, submit a personal statement of purpose, a complete resume showing evidence of leadership, a copy of the teacher license, and recommendations from school administrators. Application deadline is January 15 for enrollment in either the following summer or fall semesters.

Admission decisions are based on an analysis of applicant profiles made by program faculty and clinical instructors. From mid-February to mid-March applicants with the highest profile rankings are invited to participate in interviews. Program faculty, clinical faculty, acting principals/assistant principals, and student interns serve on the interview teams. These interviews are designed to provide the applicant an opportunity to show evidence of academic strengths, leadership potential, and personal characteristics. After the interview, the applicant is expected to prepare a writing sample.

The Master of School Administration Program faculty is committed to achieving diversity among the students admitted in each year’s cohort group and will make admission decisions accordingly. Applicants will be notified of their admission status by April 1.

Degree Requirements
The M.S.A. program requires a total of 48 hours of core courses, educational administration courses, and cognate courses outside the College of Education:

Core Courses (6 hours)
- RSCH 6101 Educational Research Methods (3)
- EDUC 6102 Person in School & Urban Society (3)
  or
- EIST 6101 The Adult Learner (3)

Educational Administration Courses (36 hours)
- ADMN 6100 Fundamentals of Educational Leadership (3)
- ADMN 6105 Legal Aspects of Schooling (3)
- ADMN 6110 School Leadership and Management (3)
- ADMN 6120 Instructional Leadership (3)
ADMN 6130 Supervision of Instruction (3)
ADMN 6140 Curriculum Leadership (3)
ADMN 6410 Internship and Seminar Part I (9)
ADMN 6420 Internship and Seminar Part II (9)

Electives (6 hours)
These courses must be approved by the student's advisor and may be selected from any available 6000 level course offered at the University.

Capstone Experiences
Students must complete both a comprehensive examination and a major project. The examination challenges students to demonstrate a thorough and well-integrated understanding of the basic principles, research findings, and theories covered in their course work and apply these principles, findings, and theories to educational practice and leadership at the school level. The culminating project grows out of the student's internship and is collaboratively planned by the student, program faculty, and the building principal who supervised the student's internship. The student must prepare a detailed written description of the project and defend it orally before a faculty committee and fellow interns in the program.

Principal Fellows
Each year a limited number of scholarship/loans for persons seeking an M.S.A. as full-time students are available from the North Carolina Principal Fellows Program. Funded by the North Carolina General Assembly to help highly qualified persons study school administration on a full-time basis, the program provides $40,000 over a two-year period and requires repayment with either four years of service as a school administrator in a North Carolina public school or monetary reimbursement of the original loan, plus interest.

In the spring of each year, the North Carolina Principal Fellows Commission selects new Principal Fellows from applications received prior to March 1. To be eligible for consideration, an applicant must provide evidence of at least four years of successful teaching experience (or equivalent experience), at least a 3.2 grade point average in his or her last 60 hours of college-level study, and unconditional admission as a full-time student in one of the state's M.S.A. programs. Additional admission criteria and procedures are described in an application packet that can be obtained from the North Carolina Principal Fellows Program website at http://www.ga.unc.edu/Principal_Fellows/.

EDUCATIONAL ADMINISTRATION
Advanced Educational Leadership

Department of Educational Leadership
Chair, J. Allen Queen
3123 Colvard Building
704-687-4717
http://www.uncc.edu/colleges/education/eart/

Degree
Ed.D.

Coordinator
Dr. Louise Allen

Graduate Faculty
Professors
Robert Algozzine
Carl Ashbaugh
John Gretes
Corey Lock
Jim Lyons
J. Allen Queen
Associate Professor
Claudia Flowers
Assistant Professors
Louise Allen
Marty Bray
Dawson Hancock
Rich Lambert
Glenda Poole

Program of Study
The Ed.D. program in Educational Leadership is designed to prepare educational administrators who can assume mid-level and senior-level leadership positions in precollegiate educational settings.

The program requires 60 hours beyond the master's degree and builds on the Master of School Administration (M.S.A.), Master of Education in Curriculum Supervision, Master of Education in Instructional Technology or comparable programs.

Although the maximum amount of credit past the Master's degree that an Ed.D. student may count towards a doctorate is 6 semester hours, only educational administration courses recommended by the student's advisor and approved by the program coordinator may be transferred. Also, no courses completed more than five years before the time they first register as doctoral students will be counted. This rule applies whether the courses were taken at UNC Charlotte or elsewhere; however, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.
Time Limit
Candidates must complete all course work for the degree, including accepted transferred credit, within eight years from the time they first register as doctoral students. Courses that exceed this time limit must be revalidated or retaken; whichever the graduate program decides is necessary, if they are to be included in the degree program.

To revalidate a course, the student, along with the program coordinator, must prepare a revalidation plan, which must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate a course with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions.

Program Objectives
As prospective mid- and senior-level school leaders, graduates of the program are prepared to: exhibit a broad and systematic understanding of professional education; demonstrate leadership competencies and skills necessary to accomplish the goals of complex organizations; interact successfully with the numerous institutions and interests that influence education and the complex milieu in which schools operate; administer high-quality programs in schools and school districts; understand theoretical concepts that undergird organizational theory and behavior, leadership, social psychology, policy development, and organizational change; address basic issues that face educational leaders, including resource acquisition and management, policy development and analysis, program management, policy development and analysis, program development and evaluation, staff selection and appraisal, school-community relations, and curriculum development and school community relations, and curriculum development and instruction; and conduct research on problems and needs facing school today and apply research findings in an informed and critical manner and understand, appreciate, and behave consistently with ethical codes of conduct that are relevant to educational leaders in today's elementary, middle, and secondary schools.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, applicants must have a master’s degree in school administration, OR educational supervision, OR instructional technology, OR a closely related field; they also must have an entry-level license in educational administration or supervision; and they must have a minimum of three years of successful leadership experience, which may include the full-time internships. Applicants must also submit a personal essay of purpose; a description of their previous relevant employment, highlighting their leadership experiences in school-settings; and recommendations from school administrators and former university instructors.

Admission decisions are based on a comparison of applicant profiles and are made by a departmental admissions committee that includes program faculty. Applicants with the highest profile rankings are invited to participate in interviews that are conducted by the Ed.D. Admissions Committee is designed to provide evidence of an applicant’s academic strength, leadership potential, and personal characteristics. Admission decisions are based not only on the comparative profiles of all applicants, but also on the commitment of the Admissions Committee to achieve diversity among the students admitted in each year’s cohort group. Admission decisions are made in the spring, with the expectation that admitted students will begin their course work in the summer.

Degree Requirements
The Ed.D. Program in Educational Leadership requires a total of 60 hours of educational leadership courses, research courses, instructional technology courses and electives at the 8000 level offered by the University. Students must also complete a residency of at least 18 credit hours over three successive terms of enrollment, written and oral comprehensive examinations, internship or practicum in a K-12 school district, and a doctoral dissertation research study.

Students are admitted as members of a cohort. After the first year of study, students move into their area of specialization: (1) Educational Leadership: The Superintendency, (2) Curriculum Leadership and Instructional Supervision or (3) Educational Research, Program Evaluation and Instructional Technology.

Students pursuing licensure as a district superintendent must complete the specialization (1) Educational Leadership: The Superintendency and the related concentration: Track One. Students entering this specialization must hold a valid North Carolina Principal’s Certificate or equivalent.

Students pursuing advanced licensure as a curriculum director must complete the specialization (2) Curriculum Leadership and Instructional Supervision with the related concentration Track Two. Students entering this specialization must hold a valid North Carolina Principal or Curriculum-Instructional Specialist Certificate or equivalent.

Students pursuing a greater depth of knowledge and understanding in research and instructional technology will complete specialization (3) Educational Research, Program Evaluation, and Instructional Technology with the related concentration Track Three. Students interested in receiving advanced licensure must hold a valid North Carolina’s Principal or Curriculum-
Instructional Specialist Certificate or equivalent. Outstanding candidates with a master’s doctorate in another area may be considered for this specialization. The practicum is replaced with an elective. No licensure or certificate will be recommended for this student upon graduation.

Educational Leadership Courses and Schedule

**Foundations-Year One-18 hours**
- RSCH 8210 Applied Educational Research (3)
- ADMN 8610 Interdisciplinary Seminar (3)
- ADMN 8160 Educational Leadership (3)
- RSCH 8110 Descriptive & Inferential Statistics (3)
- ADMN 8121 Strategies & Designs in Curriculum (3)
- RSCH 8120 Advanced Statistics (3)

**Specializations-Year Two-18 hours**
Students choose one specialization of study in Educational Leadership

(1) **Educational Leadership: The Superintendency**
- ADMN 8140 Advanced School Finance (3)
- ADMN 8130 Educational Government & Policy (3)
- ADMN 8110 Organizational Theory & Behavior (3)
- CURR 8122 Advanced Curriculum Theory (3)
- ADMN 8150 Human Resources & Development (3)
- ADMN 8120 Advanced School Law (3)

(2) **Curriculum Leadership & Instructional Supervision**
- ADMN 8140 Advanced School Finance (3)
- ADMN 8125 Advanced Instructional Technique (3)
- CURR 8122 Advanced Curriculum Theory (3)
- ADMN 8660 Instructional Leadership Seminar (3)
- ADMN 8120 Advanced School Law (3)
- ADMN 8695 Advanced Seminar in Teaching & Learning (3)

(3) **Educational Research, Program Evaluation & Instructional Technology**
- RSCH 8212 Survey Research Methods (3)
- EIST 8120 Current Trends in Instructional Systems (3)
- EIST 8100 Readings in IST Research (3)
- ADMN 8660 Instructional Leadership Seminar (3)
- RSCH 8211 Qualitative Research Methods (3)
- ADMN 8140 Advanced School Law (3)

**Concentrations-Year Three-12 hours**
Students must complete a concentration in Educational Leadership

**Track One**
**Educational Leadership, Assessment & Internship**
- RSCH 8211 Qualitative Research Methods (3)
- EIST 8101 The Adult Learner (3)
- ADMN 8410 Advanced Internship in Educational Leadership Part I (3)
- ADMN 8420 Advanced Internship in Educational Leadership Part II (3)

**Track Two**
**Instructional Leadership & Student Achievement**
- RSCH 8211 Qualitative Research Methods (3)
- EIST 8101 The Adult Learner (3)
- RSCH 8196 Program Evaluation Methods (3)
- ADMN 8489 Practicum in Staff Development (3)

**Track Three**
**Evaluation, Assessment and Technology**
- RSCH 8130 Presentation and Computer Analysis of Data (3)
- RSCH 8140 Multivariate Statistics (3)
- EIST 8150 Systematic Designs of Educational Systems (3)
- ADMN 8489 Practicum in Staff Development (3)

**Electives (6) Courses must be 8000 level and offered within the University. Permission of the department offering the courses and approval by the student's advisor is required.**

**Dissertation-Years Four & Five-6 hours**
- ADMN 8699 Proposal Design (3)
- ADMN 8999 Dissertation (3)

**Admission to Candidacy Requirements**
Students are recommended for admission to candidacy after successfully completing the written and oral comprehensive examination.

**Internships**
All students seeking licensure are required to complete an internship or practicum in a K-12 school district. The internship is based upon identified objectives and organizational areas within the school system of the internship assignment. Students are also required to complete a project based upon a current educational leadership topic related to student achievement.

**Comprehensive Examination**
Students are required to successfully pass a written and oral examination. The examination is based upon the core areas of educational leadership, educational research, and instructional technology.

**Dissertation**
Students must complete and defend a dissertation focused on a specific problem or question relevant to K-12 educational organizations, administration, or leadership. Students must be continually enrolled in ADMN 8999 (3 hrs) (fall, summer and spring sessions) for dissertation research credit, beginning with the semester following completion of the comprehensive examination and continuing through the semester of their graduation. Defense of their dissertation is conducted in a final oral examination that is open to members of the University community.
Application for Degree
Students may submit an Application for Degree during the semester in which they successfully defend their dissertation proposal. Adherence to Graduate School deadlines is expected. Degree requirements are completed when students successfully defend their dissertation and file the final copy of the dissertation in the Graduate School.

COURSES IN EDUCATIONAL ADMINISTRATION

ADMN 6000. Topics in Educational Administration. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

ADMN 6100. Fundamentals of Educational Leadership. (3) The developing role of educational organizations in the United States and the societal and cultural influences that affect the delivery of schooling. Structure and organization of American schools, administrative and organizational theory, legal, moral, and ethical dimensions of schooling within the context of restructuring and reform. (Fall)

ADMN 6105. Legal Aspects of Schooling. (3) Education law for education professionals which focuses on the legal rights and responsibilities of students, teachers, and administrators and how these legal provisions affect educational policy and practice. (Spring)

ADMN 6106. Legal Issues in Special Education. (3) Survey of federal and state statutory and administrative provisions governing the delivery of education and related services to exceptional students. (On demand)

ADMN 6107. School Law for Counselors and Related Professionals. (3) Legal issues and problems of special relevance to school counselors, psychologists, social workers, and related professionals who work with school-age children. (On demand)

ADMN 6110. School Leadership and Management. (3) Examination of school leadership and administration, focusing on the role, tasks, and responsibilities that accompany school-based leadership. (Summer)

ADMN 6120. Instructional Leadership. (3) Examination of research-based teaching/learning models and the relationship between instructional decisions and curriculum experiences. Dynamics of group development and problems/practices related to providing instructional assistance to teachers. (Summer)

ADMN 6130. Supervision of Instruction. (3) Corequisite: ADMN 6410. Introduction to clinical supervision and development of skills in classroom observation, analysis, evaluation, and assistance. Systems of observation, principles of adult development in school settings, techniques for conducting classroom observations and conferences, and development of staff development programs to remedy assessed weaknesses. (Fall)

ADMN 6140. Curriculum Leadership. (3) Examination of internal and external influences on curriculum formation and development at the building level with emphasis on development of administrative strategies for curriculum decision-making which are driven by staff involvement. (Spring)

ADMN 6161. The Principalship. (3) Examination of school administration focusing on the role, task and responsibilities associated with the principalship with special attention to the conceptual, human and technical skills associated with the principal. (On demand)

ADMN 6166. Educational Leadership. (3) Examination of leadership in formal organizations and social and behavioral science research concerning leadership ability with emphasis on educational organizations and the role of the leader in the accomplishment of organizational goals. (On demand)

ADMN 6410. Internship and Seminar Part I. (3-9) Corequisite: ADMN 6130. Full-time, academic year internship in educational administration designed to allow theoretical and course-based practical learning to be translated and interwoven into a supervised field-based experience. (Fall)

ADMN 6420. Internship and Seminar Part II. (3-9) A continuation of the internship experiences and seminar begun in ADMN 6410. (Spring)

ADMN 6490. Internship and Seminar: Administration. (3-6) Prerequisite: Department approval. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the professional administrator. Seminars are held concurrently. (On demand)

ADMN 6491. Internship and Seminar: Supervision. (3-6) Prerequisite: Permission of the department. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the curriculum-instructional specialist. Seminars are held concurrently. (On demand)

ADMN 6601. Seminar in Administration and Supervision. (1-3) Prerequisite: Permission of the department. Examination of selected areas of interest in educational administration and supervision. May be
repeated for credit with departmental approval. *(On demand)*

**ADMN 6800. Individual Study in Educational Administration.** *(1-6)* Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

**Advanced Graduate Students Only**

**ADMN 7190. Public School Administration.** *(3)* Examination of theory and practice of public school administration including the roles of school boards, superintendents, central office administrators and other members of the leadership team at the district-wide level with emphasis on the role of the superintendent. *(On demand)*

**ADMN 7194. Planning School Facilities.** *(3)* Examination of practices, principles and procedures related to educational facility planning including an overview of the major steps involved in planning educational facilities and the roles of all participants in a building program with special emphasis on the roles of the superintendent and board of education. *(On demand)*

**ADMN 7250. Educational Policy Studies: Trends, Issues, and Problems.** *(3)* Examination of educational issues, trends, problems, proposals, policies, and practices within historical, social, economic, political, and philosophical contexts. *(On demand)*

**ADMN 7490. Culminating Experience: Administration.** *(3-6)* Demonstration of appropriate leadership abilities in a field setting. Required for school administrators. May be repeated for credit. *(On demand)*

**ADMN 7491. Culminating Experience: Supervision.** *(3-6)* Demonstration of appropriate leadership skills in a field setting. Required for curriculum and instruction specialists. May be repeated for credit. *(On demand)*

**ADMN 7601. Seminar in Administration and Supervision.** *(1-3)* Prerequisite: Permission of the department. Examination of selected areas of educational administration and supervision. May be repeated for credit with departmental approval. *(On demand)*

**ADMN 7800. Individual Study in Educational Administration.** *(1-6)* Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

**ADMN 7999. Graduate Residence.** *(1)* Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

**Doctoral Students Only**

**ADMN 8110. Organizational Theory and Behavior.** *(3)* Prerequisite: Admission to Ed.D. program in Educational Leadership. Analysis of the structure and organization of public education in the United States in terms of organizational theory and historical development. Consideration of organizational change theory, organizational development, and the planning process. *(Fall)*

**ADMN 8120. Advanced School Law.** *(3)* Prerequisite: ADMN 6105 or 6107 or permission of the instructor. Current policy issues, including educational finance, testing/grouping, desegregation/integration, and the provision of public educational services to private-school students. *(Spring)*

**ADMN 8121. Strategies and Designs in Curriculum Development.** *(3)* Examination of principles and practices for educational leaders in program design, implementation and evaluation. *(On demand)*

**ADMN 8125. Advanced Instructional Techniques.** *(3)* Analysis of models of teaching and the match between attributes of the models and the instructional outcomes desired by the teacher. *(On demand)*

**ADMN 8130. Educational Governance and Policy Studies.** *(3)* Prerequisite: Admission to Ed.D. program in Educational Leadership. An examination of the institutional structure for policy-making in American education and the theories, models and practices that relate to policy-making in education. *(Summer)*

**ADMN 8140. School Finance.** *(3)* Prerequisite: Admission to Ed.D. program in Educational Leadership or permission of instructor. An examination of the theory and operation of public school finance systems and school business administration with special attention to local, state, and federal sources of revenue and such business functions as budgeting and financing capital outlay projects. *(Fall)*

**ADMN 8150. Human Resources Development and Administration.** *(3)* Prerequisite: ADMN 8110 or initial licensure as school administrator. Examination of personnel administration in educational institutions, including administration of personnel at the school district level and its contribution to the overall management and operation of a school system. *(Summer)*

**ADMN 8160. Introduction to Educational Administration.** *(3)* Examination of behavioral components of administrative theory, organization, decision-making and planning for educational development including appraisal of significant functions, techniques, practices and problems as they relate to public school systems, social institutions, and the system of social and governmental agencies. *(Fall)*
ADMN 8410. Advanced Internship in Educational Leadership Part I. (3) Prerequisites: ADMN 8110, 8120, 8130, and 8140. Internship experiences planned and guided cooperatively by University and school personnel, including some work in private, community, or social service organizations. Accompanying cohort seminar for integrating and synthesizing knowledge and skills useful to practicing school leaders. (Fall)

ADMN 8420. Advanced Internship in Educational Leadership Part II. (3) Prerequisite: ADMN 8410. Continuation of ADMN 8410. (Spring)

ADMN 8489. Practicum in Staff Development. (3) Examination of techniques of delivering in-service training and development of leadership for in-service educational programs including design and implementation of a staff development program in a school setting. (Fall, Spring)

ADMN 8610. Interdisciplinary Seminar. (3) Prerequisite: Admission to Ed.D. program in Educational Leadership. Ideas, values, cultures, and contemporary issues affecting society generally and education particularly and principles and practices for responding to the publics with whom school leaders interact. May be repeated for credit. (Summer)

ADMN 8660. Instructional Leadership Seminar. (3) Prerequisite: EDUC 8122. Investigation and evaluation of current trends and issues in supervision as they relate to the role of the educational leader, with special attention to the role of facilitating the teaching/learning process. (Summer)

ADMN 8695. Advanced Seminar in Teaching and Learning. (3) Examination of a number of current teaching models to provide a framework for choosing those appropriate for a given classroom setting with special attention to the relationship between teaching strategies and learning outcomes. (On Demand)

ADMN 8699. Dissertation Proposal Seminar. (3) Prerequisite: Completion of research requirements. Identification and definition of a research area and development of a proposal draft for an original research study appropriate for the dissertation requirement. (Fall)

ADMN 8999. Dissertation Research. (3) Prerequisite: Consent of Ed.D. program coordinator. Execution of original research study that addresses the solution to an educational or school-related problem or that addresses a substantive educational leadership or programmatic issue. (Fall, Spring, Summer)

CURR 8122. Advanced Curriculum Theory. (3) An examination of philosophic thought and its relationship to educational theories which have led to assumptions for educational practices in American schools. (On demand)

EIST 8101. The Adult Learner. (3) The focus of this course will be on the examination of how adults learn in instructional settings. Characteristics of the adult learner will be examined. Students will investigate adult learning theory as well as current trends and advancements in adult learning. The focus will be on making better instructional decisions and media selection for the education and training of adults. (Fall, Summer)

ELEMENTARY EDUCATION

Department of Reading and Elementary Education
5062 Colvard Building
704-687-4500

Degree
M.Ed.

Coordinator
Dr. Jack Piel

The Program
The master’s (M.Ed.) program in Elementary Education is a K-6 instructional degree that leads to the “M” level teaching license. This 39-hour program promotes the following strands of competence:

1) Instructional Leader and Mentor
This degree program enables graduates to develop leadership/mentorship skills

2) Career Path for Teachers as Educational Leaders
Learn “best practices” for instructional tactics based on current research findings in education. Completion of this degree program will enable graduates to advance up the pay scale through a 10% salary increase.

3) National Board Certification Alignment
Completion of this program will assist graduates in the pursuit of National Board Certification.

Program Goals
Master teachers are self-directed in their personal and professional growth as educators.
Master teachers are responsive to children’s differences influenced by development, exceptionalities, and diversity.
Master teachers are well-grounded in the content and pedagogy of the entire elementary curriculum.
Master teachers are self-reflective, self-evaluative, and educational researchers.
Master teachers are collaborative educational leaders.
Instructional Phases
This degree program is organized so that students will become instructional leaders through:

1) Phase I Developing Perspectives
Thirteen (13) hours of Professional, Theoretical, and Research coursework applicable to elementary education. This coursework establishes the basis for Phase II and Phase III.

2) Phase II Content and Pedagogy
Sixteen (16) hours of coursework based on current research findings. Graduates will investigate and share effective instructional practices designed to improve learning in the classroom.

3) Phase III Collaborative Leadership
Four (4) hour block of coursework developed to help students achieve the necessary skills to become instructional leaders and mentors within a public school setting.

Electives
Six (6) hour requirement selected from a variety of course offerings designed to allow teacher leaders to guide their own learning relative to goals and interests

Phase I. Developing Perspectives
Complete Phase I core requirements according to approved plan before beginning Phase II. Note Prerequisite for ELED 6220 (ELED 6101).

Requirements (13 hours)
- ELED 6101 Applications of Theories of Human Development and Learning (3)
- RSCH 6101 Educational Research Methods (3)
- ELED 6111 Critical Issues in Elementary Education (3)
- ELED 6220 Integrating the Elementary Program (3)
- ELED 6691A Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy
Complete requirements of Phase II according to your approved plan before Phase III.

Requirements (16 hours)
- EDUC 6254 Individualizing Instruction for Diverse Learners (3)
- ELED 6221 Teaching and Learning K-6 Science (3)
- ELED 6241 Teaching and Learning K-6 Social Studies (3)
- ELED 6252 Teaching and Learning K-6 Mathematics (3) or 6255 Math CAMMP (3)
- READ 6250 Language Development and Reading (3)
- ELED 6691B Seminar in Professional and Leadership Development (1)

COURSES IN ELEMENTARY EDUCATION

ELED 6000. Topics in Elementary Education. (1-6)
May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

ELED 6101. Applications of Theories of Human Development and Learning. (3) Review of paradigms of human development theory as a basis for identifying and clarifying teachers’ beliefs about development and learning. Analysis and subsequent improvement of alignment of teachers’ instructional practices to their chosen theoretical paradigms. (Fall, Spring)

ELED 6111. Critical Issues in Elementary Education. (3) Three categories of instructor-and student-selected issues: government, governance, and the elementary schools; changing educational roles of professional educators, parents, and children; and the evolving missions of elementary schools. Focus on the self as learner and the re-examination of one’s beliefs, teaching practices, and learning in multiple contexts. (Fall) (Summer)

ELED 6220. Integrating the Elementary Program. (3) Prerequisite: ELED 6101. Theoretical and historical roots of the integrated curriculum, factors which have supported or constrained implementation of this model, and methods for meaningful curriculum integration across subject areas and home/school cultures. (Spring) (Summer)

ELED 6221. Teaching and Learning K-6 Science. (3) Prerequisites: Completion of Phase One. Critical reading and use of the literature in science education, examination of science content taught in the elementary school, multiple models and approaches for teaching and assessing learning in science, required action research project. (Fall)

ELED 6241. Teaching and Learning K-6 Social Studies. (3) Prerequisites: Completion of Phase One. Critical reading and use of the literature in social studies education, examination of social studies content taught in the elementary school, multiple models and approaches for teaching and assessing learning in social studies, required action research project. (Spring)

ELED 6251. Teaching and Learning Mathematics. (3) Prerequisite: core requirements. Examination of the K-6 mathematics curriculum, including a critical analysis of research literature related to problem solving processes and mathematics learning. (Yearly) (Evenings)

ELED 6252. Teaching and Learning K-6 Mathematics. (3) Prerequisite: Completion of Phase One. Critical reading and use of the literature in mathematics education, examination of mathematics content taught in the elementary school, multiple models
and approaches for teaching and assessing learning in mathematics, required action research project. *(Fall, Spring)*

**ELED 6255. Math CAMMP. (3)** Computer Applications and Manipulative Mathematics Program. Examination of constructivism in K-8 mathematics teaching, with emphasis on concrete, representational, and symbolic manipulatives; developmentally appropriate computer software; developmentally appropriate instructional tactics; and preparing a thematic instructional module. The course culminates in a week long practicum with elementary students. *(Summer)*

**ELED 6470. Elementary Education Clinical Experience. (3-6)** Prerequisite: Department approval. Program of experiential learning activities in an approved school setting (K-6). Departmental approval required. *(On demand)*

**ELED 6474. Advanced Practicum in Teaching, Learning, and Leadership. (3)** Prerequisites: Completion of Phase I and II courses and permission of the department. Advanced study, consideration, selected application, and evaluation of principles and practices which master teachers use to mentor the professional development of peers, collaborate with others, influence educational practices beyond their own classrooms, and support elementary students’ development of competence and responsibility for their own learning and behavior. *(Fall, Spring)*

**ELED 6691. Seminar in Professional and Leadership Development. (1)** Seminar focused on the self-direction and collaboration of teachers as they design, develop, and present their individual program plans, their basic program portfolio, and their capstone experience of the Master’s Research Project or Comprehensive Portfolio. (Must be repeated once per program phase, for a total of 3 credit hours.) *(Spring)*

**ELED 6800. Individual Study in Elementary Education. (1-6)** Prerequisite: Permission of the student’s advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

**ELED 7999. Graduate Residence. (1)** Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

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## INSTRUCTIONAL SYSTEMS TECHNOLOGY

**Department of Educational Leadership**  
Chair, J. Allen Queen  
3123 Colvard Building  
704-687-4717  
http://www.uncc.edu/colleges/education/eart/

**Degree**  
M. Ed.

**Coordinator**  
Dr. John Grete

**Graduate Faculty**  
Professor  
John A. Grete  
Assistant Professor  
Marty Bray

Designed for both teachers in public or private schools and persons in the private sector who wish to increase their instructional technology skills and who seek to develop skills for designing and implementing curriculum and instructional strategies that incorporate instructional systems technology. The M.Ed. Program in Instructional Systems Technology qualifies graduates who already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Instruction (or from another state) for the new Masters/Advanced Competencies "M" license in Instructional Technology Specialists: Computers (NC 077) license as well as the Curriculum and Instructional Specialist (NC 113) "M" level license.

**Program Objectives**

Aligned with the 1997 North Carolina Excellent Schools Act and the propositions of the National Board for Professional Teaching Standards, the program prepares graduates to:

1. integrate appropriate technology into learning systems;
2. undertake instructional analyses that include task analysis,
3. audience analysis, instructional environment analysis, and both target enabling objectives and measures;
4. identify criteria, strategies, services, and information sources for hardware and courseware evaluation, selection, and integration;
5. plan, develop, revise, and evaluate courseware using a standard planning process and accepted standards and criteria;
6. evaluate instructional technology systems;
7. work effectively as members of a design and development team that generates solutions to instructional problems; and
8. provide leadership in the field of instructional systems technology systems.
Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, applicants seeking the new Master's/Advanced Competencies "M" license in Instructional Technology Specialist: Computers must already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Instruction (or its equivalent from another state).

Given the nature and size of the graduate degree program, applicants are only admitted for the Fall of each year. Each entering group of students will be provided a sequence of course offerings for the program. This allows students to know when the courses they will need are offered. Please contact the Graduate School for application deadlines.

Degree Requirements
The M.Ed. Program in Instructional Systems Technology requires a total of 39 hours of courses of foundations courses (18 hours), instructional development courses (6 hours), internship and seminar (6 hours), plus related coursework (9 hours). Students must also complete the "Capstone" experience described below.

Foundations I (9 hours)
- EIST 6101 The Adult Learner (3)
- RSCH 6101 Educational Research and Evaluation (3)
- EIST 6100 Readings in IST (3)

Foundations II (9 hours)
- EIST 6110 Instructional Design (3)
- EIST 6135 Learning, Media, Resources and Technology (3)
- EIST 6121 Instructional Courseware Authoring (3)

Instructional Development (6 hours)
- EIST 6130 Instructional Development Part I (3)
- EIST 6140 Instructional Development Part II (3)

Internship Seminar (6 hours)
- EIST 6491 Internship and Seminar IST Part I (3)
- EIST 6492 Internship and Seminar IST Part II (3)

Related Coursework (9 hours)
Courses may be selected from the following categories and must be approved by the student's advisor: educational research and evaluation, MIS, technical writing, curriculum and instruction, computer systems and networking, *administration and supervision courses.

*For the Instructional Technology Specialist: Computers "M" license the following courses must be completed as a part of the related coursework for the degree:
- ADMN 6120 Instructional Leadership (3)
- ADMN 6130 Supervision of Instruction (3)

A third 3-hour course may be selected by the student and the advisor (see categories listed above for suggested coursework).

Capstone Experience
Students must complete a Master's Project or Thesis. The project may take the form of a thesis, research study, or program development activity. The project is followed by an oral examination in which the student clarifies, expands, and defends his or her master's project. Please contact the Graduate School for information regarding the Thesis requirements.

COURSES IN INSTRUCTIONAL SYSTEMS TECHNOLOGY

EIST 5100. Computer Applications in Education (3)
Computer systems and software for enhancing teaching, learning, and educational management; evaluating, selecting, and integrating courseware; focus on current PC operating system, word processing, database, spreadsheet, presentation, Internet, e-mail, and multimedia software. (Fall, Spring, Summer)

EIST 6000 - 8000. Topics in Instructional Systems Technology. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit in different topics. (Fall, Spring, Summer)

EIST 6100 - 8100. Reading in Instructional Systems Technology. (3) Contemporary issues and trends in instructional systems technology, including foundations in learning research, instructional systems design, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization. Differentiated assignments for Doctoral students. (Fall)

EIST 6101-8101. The Adult Learner (3) The focus of this course will be on the examination of how adults learn in instructional settings. Characteristics of the adult learner will be examined. Students will investigate adult learning theory as well as current trends and advancements in adult learning. The focus will be on making better instructional decisions and media selection for the education and training of adults. Differentiated assignments for Doctoral students. (Fall, Summer)

EIST 6102-8102. Readings in Research in Instructional Systems Technology. (3) Current issues and trends in instructional systems technology research including instructional systems design, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization. Differentiated assignments for Doctoral students. (On Demand)

EIST 6110. Instructional Design. (3) Prerequisites: EDUC 6100 and RSCH 6101. Advanced instructional
design; systems development; task analysis; sequencing and delivery systems. *(Spring)*

**EIST 6120 - 8120. Current Trends in Instructional Systems Technology (3)** The focus of this course will be on the examination current and future trends in Instructional Systems Technology and Human Performance Consulting. Students will examine the most current literature in the field. Students will examine the instructional technology professional organization trends and recommendations. Differentiated assignments for Doctoral students. *(Spring)*

**EIST 6121. Instructional Courseware Authoring. (3)** Planning and developing instructional computer courseware using an authoring system to produce courseware that has application in the learning environment. *(Fall)*

**EIST 6130. Instructional Development Part I. (3)** An introduction to the instructional development process using design team roles of instructional designer, evaluator, technical writer, media support person, and project manager; students develop an instructional materials package (module) to meet a simulated need. *(Fall)*

**EIST 6135. Learning Media, Resources and Technology. (3)** Selection, use and evaluation of technological innovations in instructional media. *(Spring)*

**EIST 6140. Instructional Development Part II. (3)** Prerequisite: EIST 6130. Practical application of the instructional development process using design team roles of instructional designer, evaluator, technical writer, media support person, and project manager; students develop an instructional materials package (module) to meet a real need. *(Spring)*

**EIST 6150/8150. Systemic Design of Educational Systems (3)** Concepts and principles of the systemic analysis and design of educational systems will be covered. Emphasis will be given to the analysis of educational systems and the educational/societal trends that impact the systemic design of educational systems. Differentiated assignments for Doctoral students. Prerequisites: RSCH 6101 or RSCH 6110/8110 *(On Demand)*

**EIST 6160/8160 Design of Educational Information Systems (3)** Fundamentals of and planning for educational data systems will be covered. Topics covered will include networking technologies, Internet technologies, firewall technologies, distance education systems, and Information Systems models. Current and future trends in educational information and instructional technologies will also be covered. Emphasis will be placed on planning for and integration of these technologies into educational settings. Differentiated assignments for Doctoral students. Prerequisites: RSCH 6101 or RSCH 6110/8110 *(On Demand)*

**EIST 6491. Internship and Seminar in Instructional Systems Technology Part I. (3)** Application of knowledge and skill in instructional systems technology in a cooperating setting on or off campus; also includes a seminar. *(Fall, Spring, Summer)*

**EIST 6492. Internship and Seminar in Instructional Systems Technology Part II. (3)** Prerequisite: EIST 6491. Continued application of knowledge and skills in instructional systems technology in a cooperating setting on or off campus; also includes a seminar. *(Fall, Spring, Summer)*

**EIST 6800-8800. Individual Study in Instructional Systems Technology. (1-6)** Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. Differentiated assignments for Doctoral students. *(Fall, Spring, Summer)*

**EIST 7999. Graduate Residence. (1)** Meet Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring, Summer)*

**MIDDLE GRADES EDUCATION and SECONDARY EDUCATION**

Department of Middle Grades, Secondary, and K-12 Education
5000 Colvard North
704-687-4521
http://education.uncc.edu/mdsk

**Degree**
M.Ed.

**Coordinator**
Dr. Warren J. DiBiase

**Graduate Faculty**
Lilian Brannon, Professor
Warren DiBiase, Assistant Professor
Kimberly Hartman, Assistant professor
Jeanneine P. Jones, Associate Professor
Caroline Linse, Assistant Professor
Corey Lock, Professor
Theresa Perez, Professor
David Pugalee, Associate Professor
Program of Study

The Master of Education in Middle and Secondary Grades has been developed specifically for experienced teachers in middle and secondary schools who are seeking an opportunity to integrate advanced study in content and pedagogy with their teaching experiences. For example, students are required to take Teacher Leadership in their final semester, a course that will better prepare them to become content department chairs, interdisciplinary team leaders, or staff development specialists. Furthermore, by admitting only experienced teachers, students will serve as resources for one another and become a community of professionals who are knowledgeable, reflective, responsive, and effective practitioners. Finally, because this degree focuses on a teacher’s professional growth, it requires a comprehensive portfolio, thesis, or research project.

Program Goals

Successful graduates will possess a comprehensive pedagogical, conceptual, and reflective knowledge base that can be applied to their classrooms through well-honed and effective skills set. This developed and applied knowledge will be, in turn, shared with other professionals through a variety of leadership opportunities. Both the College’s Conceptual Framework and the following goals provide structure for the entire program:

Program graduates will be able to:
1) Self-direct their personal and professional growth;
2) Respond effectively to adolescent differences, which are influenced by development, exceptionalities, and diversity;
3) Demonstrate advanced knowledge of the content and pedagogy of the curriculum;
4) Improve educational practice through self-reflection, self-evaluation, and applied research; and
5) Serve as collaborative educational leaders.

Admission Requirements

1) A Bachelor’s degree from an accredited college or university
2) A North Carolina “A” license in Middle Grades or Secondary Education, or the equivalent from another state
3) Teaching experience in a middle grades or secondary classroom
4) An undergraduate GPA of 2.75 overall and 3.0 in the junior/senior years
5) An acceptable score on the GRE or MAT
6) A satisfactory essay providing a statement of purpose for Master’s degree study
7) Satisfactory recommendations from three professional educators

Degree Requirements

This degree requires a total of 39 hours of coursework in either middle grades or secondary education. Students must fulfill requirements in one of these two tracks.

Tracks

There are two tracks within this degree. One focuses on middle grades education and the other on secondary education. Each requires a total of 39 hours as prescribed by program requirements.

Core Courses

There are five core courses required that are common to both the middle grades and secondary tracks. These include:

- RSCH 6101 Educational Research Methods (3)
- CURR 6356 Curriculum Studies (3)
- CURR 6150 Models of Teaching (3)
- MDSK 6260 Principles of Teacher Leadership (3)
- MDSK 6691 Seminar in Professional Development (1-3)

Electives

Each track allows one three-hour elective.

Capstone Experience

Students in both middle grades and secondary must complete a capstone experience. They may choose from a comprehensive portfolio, a thesis, or a research project.

Advising

Each student will have an assigned advisor within the Department of Middle Grades, Secondary, and K-12 Education. Students will have access to a second advisor in their area of content specialization through the College of Arts and Sciences.

Licensure

Graduates will receive an Advanced Competency “M” license from the state of North Carolina in addition to their Master’s Degree.

Qualifying Examination

Acceptable scores on either the GRE or MAT.

Committees

Students will convene a committee of three graduate faculty members whom they will select with assistance from their Department advisor. The primary role of this committee is to assess the students’ culminating portfolio, thesis, or research project.

Research Opportunities and Experiences

There are many opportunities for students to participate in research studies on either an independent or collaborative basis. These opportunities are available with Department faculty members, through assigned course work, and through the culminating portfolio, thesis, or research project.

Assistantships

There are limited opportunities available within the Department of Middle Grades, Secondary, or K-12
Education. Contact the Department at 687-4521 for more information.

Program Certifications/Accreditation
Programs are accredited by both NCATE and NCDPI.

MIDDLE GRADES
EDUCATION

Degree Requirements
Total of 39 hours

Core Courses:
- RSCH 6101 Educational Research Methods (3)
- CURR 6356 Curriculum Studies (3)
- CURR 6150 Models of Teaching (3)
- MDSK 6260 Teacher Leadership (3)
- MDSK 6691 Seminar in Professional Development (3)

Middle Grades:
- MDSK 6220 Adolescence and Learning (3)
- MDLG 6225 Issues in Middle Grades Education (3)

Methods Course: Choose one from your content concentration (3)
- MDSK 6351 Advanced Methods in Middle and Secondary Science (3)
- MAED 5040 Topics in Mathematics Education: Intermediate (3)
- ENGL 6274 Contexts and Issues in the Teaching of English (3)
- MDSK 6354 Advanced Methods in Middle and Secondary Social Studies (3)

Content Specialization Requirements: 12 hours
The content field of study may be chosen from one of the following areas:
- Science
- Social Studies
- Mathematics
- English

Professional Elective: 3 hours
Graduate-level electives should be chosen in consultation with student's advisor. Other departments offer appropriate electives. Possible elective options include, but are not limited to, the following:
- EDUC 6102 Person and School in Urban Society (3)
- EIST 6110 Instructional Design (3)
- RSCH 6109 Assessment and Evaluation Methods (3)
- RSCH 6110 Descriptive and Inferential Statistics in Education (3)
- TESL 5101 Second Language Diagnosis and Evaluation (3)
- TESL 5103 Teaching English as a Second Language (3)

SECONDARY
EDUCATION

Degree Requirements
Total of 39 hours

Core Courses:
- RSCH 6101 Educational Research Methods (3)
- CURR 6356 Curriculum Studies (3)
- CURR 6150 Models of Teaching (3)
- MDSK 6260 Teacher Leadership (3)
- MDSK 6691 Seminar in Professional Development (3)

Methods Course: Choose one from your content concentration (3)
- MDSK 6351 Advanced Methods in Middle and Secondary Science (3)
- MDSK 6354 Advanced Methods in Middle and Secondary Social Studies (3)

Content Specialization Requirements: 18 hours
The content field of study may be chosen from one of the following areas:
- Science
- Social Studies

Professional Elective: 3 hours
Graduate-level electives should be chosen in consultation with student's advisor. Other departments offer appropriate electives. Possible elective options include, but are not limited to, the following:
- EDUC 6102 Person and School in Urban Society (3)
- EIST 6110 Instructional Design (3)
- RSCH 6109 Assessment and Evaluation Methods (3)
- RSCH 6110 Descriptive and Inferential Statistics in Education (3)
- TESL 5101 Second Language Diagnosis and Evaluation (3)
- TESL 5103 Teaching English as a Second Language (3)
- EDUC 7126 Comparative Education (3)
- MDSK 6250 Issues in 6-12 Science Education (3)
- MDSK 6251 Issues in 6-12 Math Education (3)
- MDSK 6254 Issues in 6-12 Social Studies Education (3)
- MDLG 6800 Individual Study in Middle Grades Education (1-6)
COURSES IN MIDDLE GRADES EDUCATION AND SECONDARY EDUCATION

Core Courses
MDSK 6260: Teacher Leadership. (3) An examination of the current research on adult learning and development, expert knowledge, and the professionalization of the field of teaching. Students develop skills to direct other educational professionals. (Fall, Spring) (Evening)

MDSK 6691. Seminar in Professional Development (1-3). Seminar focused on the self-direction and professional development of teachers. Emphasis will be placed on the design, development, and completion of the candidate's comprehensive portfolio, thesis, or research project. (Fall, Spring) (Evening)

Middle Grades Education:
MDSK 6220. Adolescence and Learning. (3) Study of adolescence as a phase of development and its relationship to the learning process. (Fall) (Evening)

MDLG 6225. Issues in Middle Grades Education. (3) Examination of educational practices in the middle grades (6-9) including trends and issues unique to that philosophy. Emphasis on broadening understanding of foundational components, organizational patterns, instructional programs and management techniques. (Spring) (Evening)

MDLG 6800. Individual Study in Middle Grades Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

Advanced Graduate Only
MDLG 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. (Fall, Spring)

Secondary Education:
SECD 6800. Individual Study in Secondary Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

Advanced Graduate Only
SECD 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. (Fall, Spring)

Methods Courses:
MDSK 6351. Advanced Methods in Middle and Secondary Science. (3) Examination of current research and scholarship on the teaching of science in middle and secondary schools. Particular emphasis on the development of advanced instructional expertise and leadership. (On demand)

MDSK 6354. Advanced Methods in Middle and Secondary Social Studies. (3) Examination of current research and scholarship on the teaching of social studies in middle and secondary schools. Particular emphasis on the development of advanced instructional expertise and leadership. (On demand)

Examples of Possible Electives:
MDSK 6250. Issues in 6-12 Science Education. (3) Orientation to content, curriculum and methods appropriate for teaching science. Emphasis is on a critical examination of current trends and practices in the teaching of science. (On demand)

MDSK 6251. Issues in 6-12 Mathematics Education. (3) Orientation to content, curriculum and methods appropriate for teaching mathematics. Emphasis is on critical examination of current trends and practices in the teaching of mathematics. (On demand)

MDSK 6254. Issues in 6-12 Social Studies Education. (3) Current issues in teaching and learning social studies. Emphasis on current trends in curriculum, advanced instructional methods, and research. (On demand)

READING EDUCATION

Department of Reading and Elementary Education
5062 Colvard Building
704-687-4500
http://education.uncc.edu/reel/

Degree
M.Ed.

Coordinator
Dr. Karen Wood

Graduate Faculty
Patricia Douville, Assistant Professor
Barbara A. Edwards, Associate Professor
Janet A. Finke, Associate Professor
Mary Beth Marr, Clinical Assistant Professor
Robert J. Rickelman, Associate Professor
Karen D. Wood, Professor

Designed for experienced teachers, the M.Ed. Program in Reading Education qualifies graduates for the new Masters/Advanced Competencies “M” license in K-12 reading education. Relevant to all areas of the K-12 curriculum, this program is designed for classroom teachers and aspiring literacy specialists who are
interested in improving instructional programs and practices that promote literacy among all learners.

**PROGRAM OBJECTIVES**
Based on guidelines published by the International Reading Association, the program prepares graduates to assume the role of a reading professional who (1) provides specialized K-12 literacy instruction and assessment in cooperation with other professionals to students in schools, reading resource centers, or clinics, (2) works cooperatively and collaboratively with other professionals in planning classroom and schoolwide programs to meet the needs of a diverse population of learners, (3) serves as a resource in the area of literacy education for teachers, administrators, and the community, and (4) provides leadership in literacy instruction through mentoring and staff development.

**Additional Admission Requirements**
In addition to the general requirements for admission to the Graduate School, applicants must hold an A level license in any teaching field from the North Carolina Department of Public Instruction (or its equivalent from another state). At least two years of teaching experience is preferred, but not required.

**Degree Requirements**
The M.Ed. Program in Reading, Language, and Literacy Education requires a total of 39 hours of courses to be taken in three sequenced phases: Developing Plans and Perspectives (13 hours), Expanding Content and Pedagogical Knowledge (12 hours), Influencing Literacy Instruction (8 hours), plus 6 hours of electives.

**Assistantships**
The Department has a limited number of Graduate Assistantships. Typical Stipends range from $5,600 to $7,000 for the academic year. Applications are available from the Department of Reading and Elementary Education, 704-687-4500.

**Phase I: Developing Plans and Perspectives** (13 hours)
- READ 6100 Current Issues and Practices in Literacy (3)
- READ 6691A Seminar in Professional Development (1)
- RSCH 6101 Introduction to Educational Research (3)
- RSCH 6111 Qualitative Research Methods in Education (3)
- ENGL 6103 Juvenile Literature (3) OR
- ENGL 5104 Multiculturalism & Children’s Literature (3)

**Phase II: Expanding Content and Pedagogical Knowledge** (12 hours)
- EDUC 6254 Teaching Diverse Learners (3)
- READ 6250 Emergent and Elementary Literacy (3)
- READ 6252 K-12 Writing Development and Instruction (3)
- READ 6255 Middle/Secondary Reading and Writing (3)

**Phase III: Influencing Literacy Instruction** (8 hours)
- READ 6260 Diagnostic Assessment and Instruction in Reading (3)
- READ 6474 Collaborative Leadership in Literacy Education (3)
- READ 6691B Seminar in Professional Development (2)

**Elective Courses** (6 hours)
Courses may be selected from the following categories and must be approved by the student’s advisor: Pedagogy, Research, Diversity, Resources, and Leadership.

**Capstone Experience**
Students have the choice of a Master’s Research Project or a Master’s Comprehensive Portfolio, which is closely aligned with requirements of the National Board for Professional Teaching Standards. Either document will be presented to graduate students and faculty during READ 6691B: Seminar in Professional Development. A committee of graduate faculty using the department’s scoring rubric will evaluate both the presentation and the document.

**COURSES IN READING EDUCATION**

**READ 6000. Topics in Reading, Language, and Literacy.** (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

**READ 6100. Current Issues and Practices in Literacy Education.** (3) Theories, research, and instructional methods associated with reading and language arts, preschool through high school; questions of effectiveness related to instructional approaches and materials; related topics such as multicultural literacy, the role of phonics, and assessment. *(Fall) (Evenings)*

**READ 6250. Emergent and Elementary Literacy.** (3) Prerequisite: Completion of Phase I. Critical reading and use of the literature in literacy education, examination of literacy content taught in the K-6 curriculum with an emphasis on pre-K and beginning reading instruction research, theory and practice, multiple models and approaches for teaching and assessing learning in literacy development, required action research project. *(Fall, Summer) (Evenings)*

**READ 6252. Writing Development and Instruction.** (3) Prerequisite: Admission to Phase II of program. Theories, research, and critical issues related to students’ writing development and effective writing instruction. Field experience and action research required. *(Fall, Summer) (Evenings)*

**READ 6255. Middle/Secondary Reading and Writing.** (3) Prerequisite: Admission to Phase II of program. Theories, research, and instructional methods
associated with reading and writing in the content areas, with a special emphasis on grades 6-12. Field experience and action research project are required. (Spring) (Evenings)

READ 6260. Diagnostic Assessment and Instruction in Reading. (3) Prerequisite: Admission to Phase III of the Reading Education program. Examination, uses, and critique of theories and research about literacy processes and problems; diagnosis and correction of reading disabilities; instructional strategies and action research designed to improve reading proficiency. (Fall) (Evenings)

READ 6474. Collaborative Leadership in Literacy Education. (3) Prerequisites: Admission to Phase III and completion of READ 6260. Investigates models and strategies for assuming the leadership responsibilities of a literacy specialist, including mentoring, staff development, school-wide literacy program development and assessment, supporting the action research of teachers, and developing partnerships with parents and community volunteers. (Spring) (Evenings)

READ 6691. Seminar in Professional Development. (1-2) Prerequisites: None for READ 6691A; completion of READ 6260 for READ 6691B. Seminar focused on the self-direction and professional development of literacy specialists, with an increasing emphasis on becoming instructional leaders, as students plan to meet their own learning needs in instructional expertise; expand their awareness of the role of the literacy specialist; design, develop, and present their basic program portfolio and their Master's Research Project or Comprehensive Portfolio. (Taken for one credit in Phase I [READ 6691A] and two credits in Phase II [READ 6691B] for a total of three credits.) (Fall, Spring) (Evenings)

READ 6800. Individual Study in Reading, Language, and Literacy. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

Advanced Graduate ONLY
READ 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive exam. (Fall, Spring)
The program requires 59 credits beyond the master's degree and builds on the Master of Education in Special Education or a comparable program. These hours include 15 credits in doctoral seminars in special education, 11 credits in research and practice (field work and writing courses), 15 credits in research, 18 credits of an individually designed specialty, and a dissertation. Additional coursework may be required for students who do not have a Master's degree or licensure in Special Education; whose master's program was not comparable to UNC Charlotte's; or whose Master's coursework is outdated.

The program will accept up to two courses as transfer from a regionally accredited doctoral granting institution, providing the Special Education Doctoral Committee determines that the course or courses to be transferred are equivalent to similar courses required in the UNC Charlotte Special Education Ph.D. program or fit the specialty area. The grade in these transfer courses must be an A or B. Transfer credits cannot replace the four core doctoral seminars in special education and all of the dissertation work must be completed at UNC Charlotte.

Timelines
Students are admitted for either fulltime study or intensive part-time study. Students must complete their degree, including the dissertation, within 8 years. The minimum time for completion for a fulltime student is 3 years. Fulltime students must meet benchmark requirements each year to maintain their status as a doctoral student. Part-time students have also must meet benchmark requirements that occur approximately every two years. These benchmarks are intended to help students achieve their goal of completing the doctorate in a timely manner.

Additional Admission Requirements
Applications for admission will be accepted once a year to begin doctoral studies in the fall semester and must be submitted to the Graduate Admissions Office by December 15th.

The following documents must be submitted with the application:

1) Two official transcripts of all academic work attempted since high school indicating a GPA of 3.5 (on a scale of 4.0) in a graduate degree program.*
2) Official report of score on the GRE or MAT that is no more than 5 years old.*
3) At least three references* of someone who knows the applicant's current work and/or academic achievements in previous degree work.
4) A two page essay describing prior experiences with individuals with exceptionalities and objectives for pursuing doctoral studies.*
5) A current resume or vita.
6) A professional writing sample (e.g., published article, manuscript submitted for publication, term paper submitted in prior coursework, abstract of thesis, teaching manual).
7) Documentation of teaching and other field experience (e.g., copy of teaching evaluation or letter recommendation from supervisor.)
8) An interview with the program faculty.
9) International students must submit official test scores on the Test of English as a Foreign Language (TOEFL) of at least 550 on the written test or 220 on the computer-based test or a score of at least 85% on the Michigan English Language Assessment Battery (MELAB). All tests must have been taken within the past two years.*

*These items are required of applicants to any of UNC Charlotte's doctoral programs.

Degree Requirements

Doctoral Seminars in Special Education (15 credits)
- SPED 8671 Doctoral Seminar in Research in Special Education (3)
- SPED 8672 Doctoral Seminar in Leadership in Special Education (3)
- SPED 8673 Doctoral Seminar in Innovation in Special Education (3)
- SPED 8674 Doctoral Seminar in Teaching in Special Education (3)
- SPED 8699 Dissertation Seminar (3)

Advanced Research Topics in Special Education also recommended (See Specialty)

Research and Practice in Special Education (11 credits)
Note: The following courses are used in the development of the portfolio.
- SPED 88471 Professional Writing (2) (Take concurrent with SPED 8671)
- SPED 88472 Research Implementation (2) (Take concurrent with SPED 8271)
- SPED 88473 Grant Writing (2) (Take concurrent with SPED 8673)
- SPED 88474 Supervision of Student Teachers (2) (Take concurrent with SPED 8674)

One of these:
- SPED 88475 College Teaching (3) (Take after coteaching at least one course) OR
- SPED 88476 Internship (3) (Take anytime after completion of first 24 credits; May be in higher education, government, agency, school district)

Research (15 credits + Doctoral Seminar in Research & Dissertation Seminar)
- RSCH 8110 Descriptive and Inferential Statistics (3)
- RSCH 8120 Advanced Statistics (3)
- SPED 8271 Single Subject & Qualitative Research in Special Education (3)

Select 2 of the following:
- RSCH 6130 Presentation and Computer Analysis of Educational Data (3)
- RSCH 8140 Multivariate Statistics (3)
The purpose of the dissertation is for doctoral students to demonstrate their ability to synthesize the professional literature and generate new knowledge for the profession through using well-established research tools. For the Ph.D. in Special Education, the dissertation may be quantitative (group or single subject) or qualitative research. Whatever type of design, it must adhere to current standards for quality as reflected in professional writing on the chosen method of research design and reflected in the current literature. Students must be continuously enrolled for dissertation research credit following completion of the third portfolio review and continuing through the semester of graduation. Defense of the dissertation is conducted in a final oral examination that is open to the university community.

Application for Degree
Students must submit an Application for Degree during the semester in which they successfully defend their dissertation proposal. Adherence to Graduate School deadlines is expected. Degree requirements are completed when students successfully defend their dissertation and file the final copy of the dissertation in the Graduate School.

MASTER OF EDUCATION

Program of Study
The mission of the Special Education (SPED) program is to "develop excellent professionals" for educational roles in public and private educational agencies and nonprofit agencies. The 39-hour M.Ed. in Special Education is organized around five major goals. These goals and related experiences are designed to help teachers become data-based decision makers. We believe that master teachers are self-reflective, lifelong learners who have an advanced understanding of child development, content, and pedagogy; and who use research, experience, and professional judgment to lead others in collaborative planning, implementation, and evaluation of effective instruction for students with disabilities. The program is responsive to expectations set forth by NCATE (National Council for the Accreditation of Teacher Education), NCDPI (North Carolina Department of Public Instruction), NBPTS (National Board of Professional Teacher Standards), CEC (Council for Exceptional Children), and the 1997 NC Excellent Schools Act. By focusing on "best practices" in special education and teacher education, the SPED program has established a model program that continuously achieves regional, state, and national recognition in scholarship, teaching, and research. Students are admitted in cohorts starting each Fall semester.

Additional Admission Requirements
For the M.Ed. in Special Education, an "A" level license in special education from the North Carolina Department of Public Instruction (or its equivalent from another state) is required. For the M.Ed. in Academically or Intellectually Gifted, an "A" level license in an

RSCH 8211 Qualitative Research Methods in Education (3)
RSCH 8212 Survey Research Methods in Education (3)
RSCH 8296 Program Evaluation Research Methods in Education (3)

Specialty (18 credits)
An individually designed specialty of graduate courses developed by student and advisor and approved by the Special Education doctoral committee. This specialty will typically be related to the student's major area of expertise (e.g., BED, LD, MD, SP, EC, Gifted, Transition), but students are encouraged to consider coursework in general education or other disciplines (e.g., taking Ed. Admin. coursework to get the 113 Certification Curriculum Instruction Specialist Certificate). It is strongly recommended that this specialty include:
- Coteaching in one or more licensure or other courses related to student's specialty
- One or more SPED 8670: Advanced Research Topics in Special Education

Additional Degree Requirements
In addition to coursework and the dissertation, students complete a portfolio of achievements related to the four focus areas- leadership, innovation, teaching, and research. This portfolio must receive satisfactory ratings from the a Portfolio Review Committee at three critical junctures known as Benchmark One, Two, and Three. The first benchmark serves as a Qualifying Examination and includes demonstration of writing, teaching, and research skills. The second and third benchmarks are comparable to the comprehensive exams required by some Ph.D. programs in Special Education. In these last two benchmarks, students not only demonstrate advanced professional skills, but also a breadth and depth of knowledge about the field. Students receive opportunities to build this portfolio through the Research and Practice coursework. The following are some of the products in the portfolio: research based paper, journal review, conference presentation, personal leadership plan, grant proposal, quality enhancement plan, and research report.

Admission to Candidacy
Once the student has an approved dissertation proposal and has passed the third benchmark, an application for candidacy should be submitted first to the advisor, then to the portfolio committee, and the Doctoral Coordinator. The application for candidacy must be submitted at least 4 weeks before the semester in which the student graduates. In the Special Education program, it is recommended that this application be made as soon as the proposal has been approved.

Dissertation Requirements
The purpose of the dissertation is for doctoral students to demonstrate their ability to synthesize the professional literature and generate new knowledge for the profession through using well-established research tools. For the Ph.D. in Special Education, the dissertation may be quantitative (group or single subject) or qualitative research. Whatever type of design, it must adhere to current standards for quality as reflected in professional writing on the chosen method of research design and reflected in the current literature. Students must be continuously enrolled for dissertation research credit following completion of the third portfolio review and continuing through the semester of graduation. Defense of the dissertation is conducted in a final oral examination that is open to the university community.
elementary, middle, or secondary education teaching field is required.

Official transcripts of all previous academic work attempted beyond high school documenting undergraduate GPA of 2.75 overall and 3.0 in jr./sr. years.

Official agency reports of satisfactory GRE or MAT test scores (30th percentile or above).

At least three evaluations from professional educators familiar with the applicant's personal and professional qualifications.

A one or two page essay describing the applicant's experience and objective in undertaking graduate study.

**Degree Requirements**

**M.Ed. in Special Education**

Phase I: Developing Perspective (10 hours)
- RSCH 6101 Educational Research Methods (3)
- EDUC 6254 Individualizing Instruction for Diverse Learners (3)
- ADMN 6106 Legal Issues in Special Education (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy (13 hours)
- SPED 6000 Topics in Special Education (3)
- SPED 6501 Applied Research in Special Education (3)
- SPED 6502 Advanced Classroom Management (3)
- SPED 6503 Instructional Design in Special Education (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

Electives (12 hours)

Phase III: Collaborative Leadership (4 hours)
- SPED 6690 Seminar in Collaboration (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

**M.Ed. in Academically or Intellectually Gifted**

Phase I: Developing Perspective (7 hours)
- RSCH 6101 Educational Research Methods (3)
- ADMN 6106 Legal Issues in Special Education (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy (22 hours)
- SPED 5211 Nature and Needs of Gifted Students (3)
- SPED 6000 Topics in Special Education (3)
- SPED 6124 Fundamentals of Instructional Adaptation for Gifted Students (3)

- SPED 6224 Contemporary Approaches to Instructional Adaptation for Gifted Students (3)
- SPED 6501 Applied Research in Special Education (3)
- SPED 6241 Curriculum Differentiation for Gifted Students (3)
- SPED 6261 Social and Emotional Need of Gifted Students (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

Electives (6 hours)

Phase III: Collaborative Leadership (4 hours)
- SPED 6690 Seminar in Collaboration (3)
- SPED 6691 Seminar in Professional and Leadership Development (1)

**Admission to Candidacy Requirements**

Apply the semester prior to planned graduation. Full-time students must have completed 19 hours and be enrolled for at least an additional 10 hours. Part-time students must have completed at least 31 hours.

**Assistantships**

The Program typically has a limited number of graduate assistantships with salaries starting at $8,000/academic year. Applications are available from the Department of Counseling, Special Education, and Child Development (704-687-2531).

**Internships**

Neither the M.Ed. in Special Education nor the M.Ed. in Academically and Intellectually Gifted require an internship.

**Practica**

Most courses require students to apply the knowledge learned in classes to public/private school classrooms.

**Capstone Experiences**

The capstone experience will be fulfilled by completing either a Master's Research Project or a Comprehensive Portfolio.

**Electives**

The M.Ed. in Special Education includes 12 elective hours. This will enable students to add-on an additional North Carolina teaching license in a disability area (i.e., behavioral-emotional disabilities, cross-categorical, learning disabilities, mental disabilities, severe and profound disabilities), complete the Graduate Certificate in Supported Employment and Transition, or complete an individualized set of courses developed as a result of participating in the first SPED 6691 seminar or from discussing possibilities with their advisor. Students in the M.Ed. in Academically and Intellectually Gifted program have 6 elective hours.
Advising
Upon acceptance into the program all students are assigned an advisor. Students are expected to meet with their advisor each semester to discuss their coursework.

Licensure
Successful completion will lead to a North Carolina masters/advanced competencies license.

Committees
Each student will have a committee of three graduate faculty members who will provide guidance through the Capstone Experience. The committee will include the student’s advisor, as well as two additional graduate faculty chosen by the student.

Application for Degree
Apply the semester prior to planned graduation. Full-time students must have completed 19 hours and be enrolled for at least an additional 10 hours. Part-time students must have completed at least 31 hours.

Research Opportunities/Experiences
The Special Education faculty continuously achieves regional, state, and national recognition in scholarship, teaching, and research. As a result students will have multiple opportunities to become involved in practical, classroom-based research. In addition “action-research” projects are required in a variety of courses.

Tuition Waivers
A person qualifies for in-state tuition if he/she; is paid on the teacher salary schedule, has established legal residence in North Carolina, is employed full-time by a North Carolina public school, but only for "courses relevant to teacher certification or to professional development as a teacher."

Financial Aid/ Financial Assistance
Information is available from the Office of Student Academic Services located in Colvard 3022 (704) 687-2508).

Program Certifications/Accreditation
Both the Special Education M.Ed. Program and the Academically and Intellectually Gifted M.Ed. Program are fully accredited by NCATE, CEC, and NCDPI.

GRADUATE CERTIFICATES
Students who hold a Bachelors Degree from an accredited university can obtain an initial North Carolina Special Education teaching license in one of four areas - - Behavioral-Emotional Disabilities, Learning Disabilities, Mental Disabilities, or Severe and Profound Disabilities, or an add-on license in Academically or Intellectually Gifted - - through the Graduate Certificate in Special Education program. Please note that at the time this catalog was published, the North Carolina Department of Public Instruction was planning to change the special education licensure categories as of Summer 2002. In addition, the College of Education has proposed a Master of Arts in Teaching (MAT) to begin in Fall 2002; upon its approval, the Graduate Certificate Program will be discontinued. For more information on the planned licensure changes and the MAT, please check our website at http://www.uncc.edu/education/MAT.

Initial Licensure In Special Education
Specialization in Behavioral-Emotional Disabilities
This initial licensure program prepares educational professionals to provide instructional services to students with behavioral and emotional disabilities in resource, self-contained, and consultative settings. Course content includes definition, identification, alternative conceptual models, assessment alternatives, management alternatives, and instructional alternatives including social skills, school survival, and affective curricula. Coursework provides an opportunity for development and implementation of appropriate IEPs and related interventions for students with behavioral and emotional disabilities. This program leads to eligibility for an initial North Carolina Teacher Licensure in Special Education: Behavioral-Emotional Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements
SPED 5270 Classroom Management (3)
SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose ONE)
SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
SPED 5170 Special Education Collaboration and Consultation (3)
SPED 6316 Transition and Life Skills (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements
SPED 6100 Introduction to Special Education (3)
SPED 5270 Classroom Management (3)
Initial Licensure in Special Education

Specialization in Learning Disabilities: This initial licensure program places emphasis on the learning disabilities specialist's role in coordinating and providing comprehensive educational services to students with learning disabilities. The program prepares educational professionals to address both the academic and social needs of students through a variety of instructional approaches. The program includes instruction and experience in identification, assessment, instructional strategies, and multidisciplinary cooperation. This program leads to eligibility for initial North Carolina Teacher Licensure in Special Education: Learning Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)
Specialization
SPED 6112 Learning Disabilities (3)
SPED 6123 Methods and Materials: Learning Disabilities (3)
SPED 6472 Internship: Learning Disabilities (6)

Initial Licensure in Special Education

Specialization in Mental Disabilities: This initial licensure program prepares educational professionals to work with learners with mental disabilities in resource, self-contained, and consultative settings. Educational programs for students who have mild to moderate mental disabilities (also known as mental retardation) emphasize the functional academics, as well as independent living, academic, and adaptive behavior skills necessary to live fully as members of families and communities. The program emphasizes effective instructional practices, collaborative efforts with other professionals and parents, and community-based clinical experiences. This program leads to eligibility for an initial North Carolina Teacher Licensure in Special Education: Mental Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements
SPED 5270 Classroom Management (3)
SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose ONE)
SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
SPED 5170 Special Education Collaboration and Consultation (3)
SPED 6316 Transition and Life Skills (3)

Specialization
SPED 6113 Mental Disabilities (3)
SPED 6121 Methods and Materials: Mental Disabilities (3)
SPED 6474 Internship: Mental Disabilities (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements
SPED 5270 Classroom Management (3)
SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
SPED 6100 Introduction to Special Education (3)
SPED 6130 Diagnostic Assessment (3)
SPED 6316 Transition and Life Skills (3)

Specialization
SPED 6113 Mental Disabilities (3)
SPED 6121 Methods and Materials: Mental Disabilities (3)
SPED 6474 Internship: Mental Disabilities (6)

Initial Licensure in Special Education

Specialization in Severe and Profound Disabilities: This initial licensure program prepares educational professionals to work with students who have severe and profound disabilities in a variety of school and community settings. Community-based, integrated settings are emphasized. Curricular issues center on providing students with functional, community-referenced skills. This program leads to eligibility for initial North Carolina Teacher Licensure in Special Education: Severe and Profound Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements
SPED 5270 Classroom Management (3)
SPED 6100 Introduction to Special Education (3)
SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
SPED 5170 Special Education Collaboration and Consultation (3)
SPED 6316 Transition and Life Skills (3)

Specialization
SPED 6113 Mental Disabilities (3)
SPED 6121 Methods and Materials: Mental Disabilities (3)
SPED 6474 Internship: Mental Disabilities (6)

Option C: Students without a license or teaching position (30 hours + PRAXIS tests + Technology Portfolio)

Requirements
SPED 5270 Classroom Management (3)
SPED 6100 Introduction to Special Education (3)
SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
SPED 6100 Introduction to Special Education (3)
SPED 6130 Diagnostic Assessment (3)
SPED 6316 Transition and Life Skills (3)

Specialization
SPED 6113 Mental Disabilities (3)
SPED 6121 Methods and Materials: Mental Disabilities (3)
SPED 6474 Internship: Mental Disabilities (6)
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**Specialization**

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<tbody>
<tr>
<td>SPED 6117</td>
<td>Introduction to Persons with Severe Disabilities (3)</td>
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<td>SPED 6127</td>
<td>Curriculum for Persons with Severe Disabilities (3)</td>
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**Option B: Lateral Entry Teachers** (27 hours + applicable PRAXIS tests)

**Requirements**

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<td>SPED 5170</td>
<td>Special Education Collaboration and Consultation (3)</td>
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<tr>
<td>SPED 6630</td>
<td>Problems and Issues of Persons with Severe Disabilities (3)</td>
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**Option C: Students without a license or teaching position** (30 hours + PRAXIS tests + Technology Portfolio)

**Requirements**

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**ADD-ON LICENSURE IN ACADEMICALLY OR INTELLECTUALLY GIFTED**

Any teacher seeking certification in Academically or Intellectually Gifted (AIG) must first hold a general teaching license in elementary, middle school, or high school instruction. A Graduate Certificate allows a consistent, cohesive structure for teachers seeking AIG licensure that both meets the state licensure mandate and also provides maximum flexibility for later graduate study.

**Requirements**

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<td>SPED 5211</td>
<td>Nature and Needs of Gifted Students</td>
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<tr>
<td>SPED 6124</td>
<td>Fundamentals of Instructional Adaptation for Gifted Students</td>
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<tr>
<td>SPED 6241</td>
<td>Curriculum Differentiation for Gifted Students</td>
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<tr>
<td>SPED 6261</td>
<td>Social and Emotional Needs of Gifted Students</td>
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**Admission Requirements for Graduate Certificate in Special Education**

Students must have a bachelor's degree from a regionally accredited university.

1) Students must submit an Application for Admission to a Graduate Program (available from the Graduate School in Kennedy 332; 704-687-3366).

2) Students must provide original transcripts that indicate a minimum overall GPA of at least 2.75 and a junior/senior GPA of at least 3.0.

3) Students are not required to take the GRE or MAT. However, students must take the GRE or MAT before applying to the Special Education master's degree program.

4) If accepted into the master's degree program, a maximum of twelve (12) Graduate Certificate hours may be applied to the master's degree program in Special Education with the consent of the Graduate Program Coordinator.

5) Admission to the Graduate Certificate program does not ensure admission into a master's degree program.

6) For Academically or Intellectually Gifted only, students must have a teaching license in an elementary, middle, or secondary education teaching field.

**Post-baccalaureate Admission Information**

1) Students must have a bachelor's degree from a regionally accredited university.
2) Complete an Application for Admission as a post-baccalaureate student (available from the Graduate School in Kennedy 332; 704-687-3366).

3) Send an official undergraduate transcript to: Dr. David W. Test, Graduate Coordinator, Special Education Program, UNC Charlotte, 9201 University City Blvd., Charlotte, NC 28223.

4) If accepted into a master's degree program, a maximum of six (6) post-baccalaureate hours may be applied towards a master's degree program with the consent of the Graduate Program Coordinator.

5) For Academically or Intellectually Gifted only, students must have a teaching license in an elementary, middle, or secondary education teaching field.

Supported Employment and Transition Graduate Certificate

The Graduate Certificate Program in Supported Employment and Transition is a 12-hour program. It serves two groups of educational professionals: (1) those who work in adult human-service agencies that provide on-the-job training and support (supported employment) for individuals with disabilities; and (2) those who work in school systems and are responsible for helping students with disabilities prepare to live, work, and learn as adults (transition from school to adulthood).

Program Objectives

As specialists in supported employment and transition for youth who have disabilities, graduates of the program are prepared to:
- Work as job coaches and employment training specialists
- Provide community-based training for persons with disabilities
- Assist students in making the transition from school to adulthood.

Additional Requirements for Admission

Applicants to the program in Supported Employment and Transition are admitted to the Graduate School in a special category for certificate students. Admission requirements are listed in the Graduate School section of the catalog. Admission to a graduate certificate program at UNC Charlotte does not ensure subsequent admission to a graduate degree program.

Certificate Requirements

The Graduate Certificate Program in Supported Employment and Transition requires a minimum of 12 semester hours, at least six of which must be at the 6000 level. No transfer credit is accepted, although UNC Charlotte "distance learning" courses in Supported Employment and Transition may be applied to meet the program's requirements. Students must earn grades of B or better in each of the courses in the 12-hour program of study. The program includes the following core courses and support courses:

Core Courses (6 hours)

- SPED 6311 Introduction to Supported Employment (3)
- or
- SPED 6316 Transition and Life Skills (3)
- SPED 6321 Community-based Instruction (3)

Support Courses (6 hours) Choose two of the following courses:

- SPED 6351 Interagency Collaboration (3)
- SPED 6640 Seminar in Special Education: Working with Families (3)
- SPED 6311 Introduction to Supported Employment (3)
- SPED 6316 Community-based Instruction (3)
- SPED 6474 Internship: Mental Disabilities (3)

COURSES IN SPECIAL EDUCATION

SPED 5000. Topics in Special Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. (On demand)

SPED 5011. Issues in Preschool Education for Children with Disabilities. (3) Current issues and trends in early intervention and preschool services for young children with disabilities and their families. Includes field trips scheduled throughout the semester. (Fall)

SPED 5110. Assessment in Special Education: Preschool. (3) Strategies for interdisciplinary educational assessment to identify needs and plan appropriate programs for young children with disabilities and their families. Approximately 20 hours of field experiences. (Fall)

SPED 5170. Special Education Consultation and Collaboration. (3) Methods for multidisciplinary planning, co-teaching with general educators in inclusive settings, utilizing paraeducators effectively, working with parents of exceptional students, and building collaborative interagency services for students with disabilities. (On demand)

SPED 5210. Instructional Methods and Materials: The Early Years. (3) Goal-setting, instructional design, and strategies for teaching young children with disabilities and their families. Includes a field-based assignment of approximately 20 hours. (Spring)

SPED 5211. Nature and Needs of Gifted Students. (3) Examination of the historical and philosophical perspectives of education for gifted and talented learners with emphasis on answering the question "What is giftedness?" Issues explored in the course include identification procedures, instructional options, the nature of intelligence and creativity, laws/policies, psychological
and emotional correlates of talent, and current research findings. (Spring)

SPED 5270. Classroom Management. (3) Theoretical context and related applied strategies necessary to manage effectively the classroom behaviors of individuals or groups of students. Requires a field-based assignment of approximately 10 hours. (Fall, Spring)

SPED 5272. Teaching Mathematics to Learners with Special Needs. (3) Strategies, techniques, and activities to teach functional mathematics to students with special needs. Assessment issues, an exploration of developmental, remedial, and functional mathematics, curricular modifications, and functional applications. Requires two hours of field-based work in schools each week. (Fall, Spring)

SPED 5276. Teaching Language Arts to Learners with Special Needs. (3) Knowledge and practice in remediation of language arts deficits and providing sound developmental instruction for learners who have special needs. Approximately 20 hours of field experiences. (Fall, Spring)

SPED 6000. Topics in Special Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

SPED 6100. Introduction to Special Education. (3) Examination of the historical antecedents of contemporary practices in the field of special education with emphasis on the conceptual models of child variance and current trends in the field of education. (Fall, Spring, Summer)

SPED 6112. Learning Disabilities. (3) Examination of learning disabilities with emphasis on theories, issues, current trends, and definitions of learning disabilities as well as instructional strategies, program models, and major contributions to the field. (Fall, Summer)

SPED 6113. Mental Disabilities. (3) Examination of historical antecedents, major contributors, current practices, issues, and trends in the field of mental retardation. (Spring)

SPED 6114. Behavioral-Emotional Disabilities. (3) Examination of major contributors, theories, issues, current trends, and current practices in the field of behavior disorders. (Spring)

SPED 6115. Mild Disabilities. (3) Examination of theories and practice of cross-categorical programming, with emphasis on theories, issues, current trends, current practices, and consultation practices. (On demand)

SPED 6117. Introduction to Persons with Severe Disabilities. (3) Social and cultural antecedents to contemporary services for persons with severe disabilities and the needs of these individuals within a developmental framework. (Fall)

SPED 6121. Methods and Materials: Mental Disabilities. (3) Examination of the principles and practices of curriculum development and modification and current instructional methodologies for learners with mental disabilities. (Fall)

SPED 6122. Methods and Materials: Behavioral-Emotional Disabilities. (3) Planning, implementation, and evaluation of instructional programs with emphasis on academic and behavioral strategies, and individualization instruction for learners with behavioral-emotional disabilities. (Fall)

SPED 6123. Methods and Materials: Learning Disabilities. (3) Planning, implementation, and evaluation of instructional programs with emphasis on individual instruction, grouping for instruction, consultation, assessment, and program planning for learners with learning disabilities. (Spring)

SPED 6124. Fundamentals of Instructional Adaptation for Gifted Students. (3) Prerequisite: SPED 5211. An introduction to the basic skills necessary to plan, implement, and evaluate instructional procedures that facilitate learning by gifted students. Specific theories discussed include Bloom, Bruner, Krathwohl, Parnes, Kohlberg. (Fall)

SPED 6125. Instructional Practices: Cross-Categorical. (3) Assessment procedures appropriate for use with students who are mildly disabled. Assessment information will be used to plan for the most appropriate instruction for students with mild disabilities receiving education in a cross-categorical setting. (On demand)

SPED 6126. Methods for Teaching Persons with Severe Disabilities. (3) Corequisite: SPED 6127. Principles and procedures used to program instruction for persons who have severe disabilities. Students are required to design and implement an instructional program. (Spring)

SPED 6127. Curriculum for Persons with Severe Disabilities. (3) Corequisite: SPED 6126. Selection of instructional programs appropriate for use with persons with severe disabilities. The student identifies strengths and weaknesses of educational programs and makes recommendations of their use with those persons. (Spring)

SPED 6130. Diagnostic Assessment. (3) Principles and practice of educational problem solving with emphasis on formal assessment, special education eligibility, and linkages between assessment and instruction. (Fall, Spring)

SPED 6224. Contemporary Approaches to Instructional Adaptation for Gifted Students. (3)
Prerequisites: SPED 5211, SPED 6124. A survey of modern models of reasoning, creativity, problem solving, and ethics and methods to plan, implement, and evaluate lessons based on those models. (Spring)

SPED 6241. Curriculum Differentiation for Gifted Students. (3) Prerequisites: SPED 5211, SPED 6124. Models of curriculum development and program structures for academically or intellectually gifted students. Emphasis on integrating the philosophy of teacher, school and community with child characteristics to create the appropriate course of study in a variety of school settings. (Spring)

SPED 6261. Social and Emotional Needs of Gifted Students. (3) Prerequisites: SPED 5211. An overview of current theory and practice in understanding gifted students social and emotional development. Topics discussed in class range from the social and emotional needs of the general population of gifted students to the unique needs of specific sub-groups of gifted students (e.g., gifted girls, gifted and learning disabled, gifted minority students). (Spring)

SPED 6311. Introduction to Supported Employment. (3) Introduction to the concept of supported employment including models of supported employment, social skills in the workplace, assessment, and importance of independent living skills. (On demand)

SPED 6316. Transition and Life Skills. (3) Methods and procedures used in preparing students with disabilities for the world of work and independence are studied. (Fall)

SPED 6321. Community-Based Instruction. (3) Prerequisite: SPED 6311. Examination of curriculum guidelines for successful supported employment programs, norm-referenced and criterion-referenced assessment, independent living skills, and social skills in the workplace. (On demand)

SPED 6351. Interagency Collaboration. (3) Prerequisites: SPED 6311 and 6321. Analysis of existing interagency agreements and practicum experiences with individuals from agencies providing supported employment or transition services. (On demand)

SPED 6470. Special Education Clinical Experience. (3) Prerequisite: Permission of department. Program of experiential learning activities in the student's level and/or area of academic concentration in an approved school setting. (Fall, Spring)

SPED 6471. Internship: Academically or Intellectually Gifted. (3) Prerequisites: SPED 5211, SPED 6124, SPED 6641; approval of department. Supervised experiences in observation, instruction, and administration of programs with gifted and talented students. Offered only on a Pass/No Credit grading. (On demand)

SPED 6472. Internship: Learning Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students with learning disabilities. Offered only on a Pass/No Credit grading. (Fall, Spring)

SPED 6473. Internship: Behavioral-Emotional Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students with behavioral-emotional disabilities. Pass/No Credit grading. (Fall, Spring)

SPED 6474. Internship: Mental Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students who have mental disabilities. Offered only on a Pass/No Credit grading. (Fall, Spring)

SPED 6475. Internship: Mild Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students who have special needs. Offered only on a Pass/No Credit grading. (Fall, Spring)

SPED 6501. Applied Research in Special Education. (3) Prerequisite: RSCH 6101 and an "A" level special education teaching license. In-depth study of single-subject and qualitative research methods as they apply to the field of special education including data collection, research designs, data display and analysis, and writing research reports. (Spring)

SPED 6502. Advanced Classroom Management. (3) Prerequisite: SPED 6501 6101 and an "A" level special education teaching license. Advanced theoretical context and related applied strategies necessary to manage and maintain effectively the classroom behaviors of individuals or groups of students. Field-based assessments of approximately 10 hours are required. (Spring)

SPED 6503. Instructional Design in Special Education. (3) Prerequisite: SPED 6501 or may be taken concurrently 6101 and an "A" level special education teaching license. Advanced instructional design for learners who have significant difficulty in performing academic tasks with typical instruction. The course provides strategies for classroom-based assessment of individual needs using curriculum analysis, task analysis, and error analysis. It provides a framework for designing instructional sequences and error correction procedures that optimize progress. Field-based experiences of approximately 10 hours are required. (Fall)
SPED 6630. Problems and Issues of Persons with Severe Disabilities. (3) Issues, trends, and practices in the education of persons with severe disabilities which master teachers and supervisors may encounter with this population. (Fall)

SPED 6640. Seminar in Special Education: Working with Families. (3) Issues and best practices in developing family-professional partnerships to support the development of persons with disabilities. Pass/No Credit grading. (On demand)

SPED 6641. Seminar in Curriculum Development: Gifted and Talented. (3) Procedures and suggestions for developing programs for academically or intellectually gifted learners; philosophy of the teacher; school and community assumptions of curriculum; child characteristics; parental concerns; teaching styles. (Spring)

SPED 6690. Seminar in Collaboration. (3) Advanced knowledge and skills in collaborating with parents, general education teachers, paraprofessionals, related service personnel, and/or human service personnel. (Fall, Spring)

SPED 6691. Seminar in Professional and Leadership Development. (1) Prerequisite: An "A" level special education teaching license. Design, development, and presentation of Master's Research Project or Comprehensive Portfolio. (Must be repeated once per phase for a total of 3 credit hours.) (Fall, Spring)

SPED 6800. Individual Study in Special Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

SPED 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. (Fall, Spring, Summer)

SPED 8671. Doctoral Seminar in Special Education Research. (3) An intensive overview of the major research designs used in Special Education including group designs, single subject designs, survey research, qualitative research, and program evaluation. Introduces students to the research interests of the faculty. (Fall)

SPED 8672. Doctoral Seminar in Leadership in Special Education. (3) An intense review of the history, landmark events, professional organizations, and seminal articles in the field of special education and related disciplines. Also includes substantial coverage of federal and state policies, IDEA, and special education law. Prepares students to build professional leadership skills in areas such as time management, systematic planning, team leadership, and communication. (Spring)

SPED 8673. Doctoral Seminar in Innovation in Special Education. (3) An advanced study of innovation in special education and methods of systems change. Emphasizes research on practitioner acceptance and collaboration/consultation skills. Prepares students to conduct program evaluations, data-based school quality enhancement plans, and offer technical assistance to schools, programs, and disability groups. (Fall)

SPED 8674. Doctoral Seminar in Teaching in Special Education. (3) Presents techniques used in the supervision and instruction of adult learners in college or school system settings. Also provides an intensive overview of current, empirically supported strategies for the instruction of learners across disability areas as an important knowledge base for leadership and college teaching roles in special education. (Spring)

SPED 8699. Dissertation Proposal Seminar in Special Education. (3) Identification and definition of a research area and development of a proposal draft for an original research study appropriate for dissertation requirement. (Fall, Spring)

SPED 8471. Professional Writing in Special Education. (2) Introduces the forms of professional writing expected of leaders in special education. Emphasis is placed on critical thinking, practice writing, and peer assessment. Students develop a portfolio of writings in the different formats. (Fall)

SPED 8472. Research Implementation in Special Education. (2) The process of conducting applied research in special education. Students design and implement a research study in collaboration with a faculty member. (Spring)

SPED 8473. Grant Writing in Special Education. (2) An experiential course in conceptualizing and developing applications for federal, state, local, and private grant funding for research and innovation efforts. A strong emphasis will be placed on applications for federal and state funding with a secondary focus on applications for corporate and private foundation funds. (Fall)

SPED 8474. Supervision of Student Teachers in Special Education. (2) An internship experience. The course includes seminar sessions and concentrated practice in supervision of special education student teachers under direct faculty supervision. (Spring)

SPED 8475. College Teaching in Special Education. (3) Issues and concepts in teaching adults and preparing special educators are applied in this college teaching experience. Supports students as they teach and/or co-teach university courses. May be repeated for up to 12 hours. (Fall, Spring, Summer)

SPED 8476. Doctoral Internship in Special Education. (3-6) Supplements students specialty areas
through leadership experiences in a field related to or impacting special education (i.e., government, school district, agency). Provides students with an opportunity to explore their leadership skills in a new role within a field-based setting with the supervision of a mentor. May be repeated for up to 6 hours. *(Fall, Spring, Summer)*

**SPED 8271. Single Subject and Qualitative Research in Special Education. (3)** In-depth study of single-subject and qualitative research methods as they apply to the field of special education including data collection, research designs, data display and analysis, and writing research reports. *(Spring)*

**SPED 8670. Advanced Research Topics in Special Education. (3)** In-depth study of a topic(s) in special education research which addresses current issues in the field. *(Fall, Spring, Summer)*

**SPED 8800. Independent Study in Special Education. (1-6)** Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

**SPED 8999. Dissertation Credits. (1-9)** Development, implementation, and evaluation of an original research study that addresses the needs of exceptional learners. *(Fall, Spring, Summer)*

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**TEACHING ENGLISH AS A SECOND LANGUAGE**

**Department of Middle Grades, Secondary and K-12 Education**

5000 Colvard North  
(704) 687-4521  
http://education.uncc.edu/mdsk/tperez@email.uncc.edu

**Degree**  
M. Ed.

**Coordinator**  
Dr. Theresa Perez

**Graduate Faculty**  
Lillian B. Brannon, Professor  
Christiane Bongartz, Assistant Professor  
Boyd H. Davis, Professor  
Warren DiBiase, Assistant Professor  
Kim Hartman, Assistant Professor  
Jeanneine Jones, Associate Professor  
Caroline Linse, Assistant Professor  
Corey Lock, Professor  
Ronald F. Lunsford, Professor  
Theresa Perez, Professor  
David Pugalee, Assistant Professor  
Blair A. Rudes, Assistant Professor  
Ralf Thiede, Associate Professor

**Program of Study**

The 39 hour M.Ed. Program in Teaching English as a Second or Foreign Language is designed to prepare teachers to work with K-12 and adult EFL (English as a Foreign Language) students both domestically and overseas. The program addresses current trends in the field by providing a balanced emphasis on the communication, cultural and linguistic features of learning English as a second language. It offers two tracks: a licensure track and a non-licensure track. The licensure track requires students to hold a current “A” level or initial license in another teaching discipline to receive licensure in ESL. Individuals holding an “A” license (initial license) receive an “M” license upon the completion of the program and are prepared for teaching in P-12 public school settings. The non-licensure track has no such requirement. Persons interested in the non-licensure track may include individuals seeking a position in community colleges, agencies, multinational corporations or overseas settings.

**Licensure Track**

Students must possess an “A” level licensure in another teaching discipline to receive licensure to teach ESL and the accompanying Master's degree. Check with the Department of Middle Grades, Secondary and K-12 Education (MDSK) for the specific requirements.

**Teaching English as a Second Language (Licensure)**

**I. Foundations (9 hours)**

- ENGL 6161 Introduction to Linguistics (3)  
- CURR 6356 Curriculum Studies (3)  
- RSCH 6101 Educational Research Methods (3)

**II. Content Specialization (9 hours)**

- ENGL 6163 Language Acquisition (3)  
- ENGL 5166 Comparative Language Studies for Teachers (3)  
- One course from the following:  
  - ENGL 5165 Language and Culture (3)  
  - ANTH 5120 Intercultural Communications (3)

**III. Instructional Specialization (12 hours)**

- TESL 5101 Second Language Diagnosis and Evaluation (3)  
- TESL 5103 Teaching English as a Second Language (3)  
- EDUC 7126 Comparative Education  
- TESL 6476 The ESL Professional in the 21st century (3)  
  *(Prerequisite: Completion of Foundations, Content Specialization, and Instructional Specialization courses)*

**IV. Instructional Leadership (3 hours)**

- MDSK 6260 Teacher Leadership (3)
V. Electives (6 hours)

Non-Licensure Track

Students do not need to possess a teaching license to receive a Master’s degree in Teaching English as a Second Language. Check with the Department of Middle Grades, Secondary and K-12 Education (MDSK) for the specific requirements.

Teaching English as a Second Language (Non-Licensure)

I. Foundations (9 hours)
   - ENGL 6161 Introduction to Linguistics (3)
   - CURR 6356 Curriculum Studies (3)
   - RSCH 6101 Educational Research Methods (3)

II. Content Specialization (9 hours)
   - ENGL 6163 Language Acquisition (3)
   - ENGL 5263 Linguistics and Language Learning (3)
   - ENGL 5166 Comparative Language Studies for Teachers (3)
   - One course from the following:
     - ENGL 5165 Language and Culture (3)
     - ANTH 5120 Intercultural Communications (3)

III. Instructional Specialization (12 hours)
   - TESL 5101 Second Language Diagnosis and Evaluation (3)
   - TESL 5103 Teaching English as a Second Language (3)
   - TESL 6476 The ESL Professional in the 21st Century (3)
   - TESL 6470 Internship

IV. Electives (6 hours)

Admission Requirements

Must meet all admission requirements as determined by the College of Education and the Graduate School.

Internship

Required for both licensure and non-licensure programs. Both domestic and international Internships are available.

Master’s Research Project or Portfolio

Students select the Master’s Research Project, the Master’s Thesis, or the Comprehensive Portfolio to fulfill this requirement. Students work with a three-member faculty committee to fulfill this requirement. One of the members of the committee is the student’s advisor.

Language Requirements

Show evidence of one semester of a foreign language at the college level.

Assistantships

A very limited number of assistantships are available through the Department of Middle Grades, Secondary and K-12 Education (MDSK). There may also be opportunities for teachers to work in the English Language Teaching Institute on campus.

Research Opportunities

There are numerous opportunities for students to participate in research through their courses and/or programs abroad.

COURSES IN TEACHING ENGLISH AS A SECOND LANGUAGE

TESL 5101. Second Language Diagnosis and Evaluation. (3) For current and future teachers of English as a Second Language (TESL) to develop multiple criteria assessment models as TESL diagnosticians and to master other competencies prescribed by the State of North Carolina. (Spring)

TESL 5103. Teaching English as a Second Language. (3) For current and future teachers of English as a Second Language (TESL) to master a variety of approaches, methods, and techniques of teaching ESL and other competencies prescribed by the State of North Carolina. (Fall)

TESL 6000. Topics in Teaching English as a Second Language. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

TESL 6470. Internship. (3) Prerequisite: Permission of department. Program of experiential learning activities in the student’s level and/or area of academic concentration in an approved setting. (Fall, Spring)

TESL 6476. The ESL Professional in the 21st Century. (3) Prerequisite: Permission of department. Supervised experiences in school or non-school teaching or training with an emphasis on developing skills as an educational professional. (Fall, Spring)

TESL 6800. Individual Study in Teaching English as a Second Language. (1-6) Prerequisite: Permission of the student’s advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. (Fall, Spring, Summer)

TESL 7999. Graduate Residence. (1) Meets Graduate School requirement for continuous enrollment during
completion of a research project, thesis, or portfolio.  
(Fall, Spring, Summer)

GENERAL GRADUATE COURSES IN EDUCATION

EDUCATION

EDUC 5000. Topics in Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics.  
(Fall, Spring, Summer)

EDUC 6000. Topics in Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics.  
(Fall, Spring, Summer)

EDUC 6100. Theories of Human Development and Learning. (3) Concepts of development; philosophical antecedents of developmental and learning theories; role of theory in explaining human nature; components of theoretical explanations; evaluating theories.  
(Summer)

EDUC 6102. The Person and School in Urban Society. (3) The basic philosophical theories and sociocultural forces that influence the objectives, structure and programs of schools, agencies and institutions in urban society.  
(On demand)

EDUC 6254. Individualizing Instruction for Diverse Learners. (3) Instructional modifications/adaptations related to meeting the individual learning needs of students. Emphasis on teaming, collaboration, and creating a classroom environment in which all learners can be successful. Differences among learners that are influenced by development, exceptionalities, and diversity are explored using case study methodology.  
(Fall, Spring, Summer)

EDUC 6274. Contexts and Issues in the Teaching of English. (4) Prerequisites: Admission to the M.A. in English Education or the M.Ed. in Middle/Secondary Education. Examine the key concepts of the discipline. Consider own identities as readers, writers, teachers, researchers, makers of meaning. Emphasis upon critical approaches and pedagogical issues, with special attention to technology in the teaching of language, composition, and literature, as well as cultural contexts for the study of English.  
(Fall)  
(Evenings)

EDUC 6651. Piagetian Theory. (3) Prerequisite: Permission of the instructor. Advanced seminar for investigation of Piagetian theory with emphasis on genetic epistemology, research and neo-Piagetian concepts.  
(On demand)

EDUC 6674. Applied Research Methods in the Teaching of English. (4) Prerequisites: Completion of ENGL/EDUC 6274 and 12 hours of graduate credit toward the M.A. in English Education. Building on the research basis established in ENGL/EDUC 6274, this course provides the opportunity to apply research methods in classrooms. Examine identities as readers, writers, teachers, and especially as classroom researchers.  
(Spring)  
(Evenings)

EDUC 6974. Thesis/Project in the Teaching of English. (6) Research integrating the fields of English and Education in a theoretical or application-oriented study. If the thesis/project is the outgrowth of previous coursework rather than a new topic, then considerable additional research and exposition must be done.  
(Fall)

EDUC 7126. Comparative Education. (3) Analysis of sociocultural forces affecting educational planning and comparison of contemporary educational systems of selected countries and the United States.  
(Spring)  
(Evenings)

RESEARCH

RSCH6101. Research Methods (3) Identification of logical, conceptual, and empirical research problems; application of methods and procedures, including conducting library research, interpreting research findings, and preparing reviews of related literature.  
(Fall, Spring, Summer)

RSCH6109. Assessment and Evaluation Methods (3) Fundamentals of individual and group assessment, including selection, administration, and interpretation of norm-referenced and criterion-referenced assessment instruments and demonstration of competencies prescribed by the State of North Carolina and other professional organizational standards.  
(Fall, Spring)

RSCH6110. Descriptive and Inferential Statistics (3) Identification of objective reporting and decision-making statistics; application of descriptive and inferential methods; illustration of elementary parametric and non-parametric techniques in hypothesis testing; and, demonstration of the fundamentals of data processing.  
(Fall, Spring, Summer)

RSCH6120. Advanced Statistics (3) Application of advanced topics in probability and statistics as a basis for objective decision-making, with emphasis on the following practices through analysis of prepared data: multiple correlation and regression, one-way and n-way analysis of variance and covariance, advanced ANOVA designs, advanced non-parametric methods, and, selected multivariate statistical procedures.  
(Spring)  
(Evenings)
RSCH6130. Presentation and Computer Analysis of Data (3) Fundamentals of data presentation and analysis using computer-based statistical packages (e.g., SPSS, SYSTAT, BMDP, SAS); application of basic descriptive statistics, correlational and associational measures, and inferential statistics emphasized in a series of analyses of prepared data; description of data sets and preparation of graphic presentations. (Fall and Spring) (Evenings)

Advanced Graduate Only
RSCH7111/RSCH8211. Qualitative Research Methods (3) Demonstration of historical, philosophical, biographical, ethnographic, and case study methods; location of information sources, application of methods of data collection and analysis, field techniques, and strategies for writing research results. (Fall, Spring)

RSCH7112/RSCH8212. Survey Research Methods (3) Techniques of survey research, including developing proposals, addressing ethical issues, selecting direct and indirect methods, preparing questionnaires, sampling, analyzing and presenting data, writing research reports, extending applications to program evaluation. (Fall)

RSCH7113/RSCH8213. Single-Case Research (3) In-depth study of single-case research methods, including data collection, research designs, data display and analysis, and report writing. (Spring)

RSCH7140/RSCH8140. Multivariate Statistics (3) Multiple regression, multivariate analysis of variance, discriminant function analysis, factor analysis, and other multivariate methods applied to descriptive, correlational, and experimental research problems. (Fall)

RSCH7196/RSCH8296. Program Evaluation Methods (3) Examination of principles, strategies, and techniques of program evaluation in order to identify, clarify, and apply defensible criteria that indicate a program's value, quality, utility, effectiveness, and/or significance. (Spring)

Doctoral Students Only
RSCH8110. Descriptive and Inferential Statistics (3) Identification of objective reporting and decision-making statistics; application of descriptive and inferential methods; illustration of elementary parametric and non-parametric techniques in hypothesis testing; and, demonstration of the fundamentals of data processing. (Fall)

RSCH8120. Advanced Statistics (3) Application of advanced topics in probability and statistics as a basis for objective decision-making, with emphasis on the following practices through analysis of prepared data: multiple correlation and regression, one-way and n-way analysis of variance and covariance, advanced ANOVA designs, advanced non-parametric methods, and, selected multivariate statistical procedures. (Spring)

RSCH8130. Presentation and Computer Analysis of Data (3) Fundamentals of data presentation and analysis using computer-based statistical packages (e.g., SPSS, SYSTAT, BMDP, SAS); application of basic descriptive statistics, correlational and associational measures, and inferential statistics emphasized in a series of analyses of prepared data; description of data sets and preparation of graphic presentations. (Fall and Spring)

RSCH8210. Applied Research Methods (3) Advanced study of qualitative (e.g., Case Study, Ethnography, Grounded Theory) and quantitative (e.g., Experimental, Single Subject, Descriptive, Correlational, Causal-Comparative) research methods and evaluation research approaches. (Summer)
THE WILLIAM STATES LEE
COLLEGE OF ENGINEERING

For more than 30 years, The William States Lee College of Engineering at the University of North Carolina at Charlotte has been known as one of the finest engineering schools in the Southeast. Emphasizing applied research in its educational programs, the college prepares students for careers in engineering through meaningful hands-on involvement and interactive teamwork. Students and faculty work with government, the private sector and other universities to develop practical advances in technology. Locally and throughout the world, their efforts effect positive economic and environmental change. With cross-disciplinary expertise and capabilities, UNC Charlotte’s renowned engineering research centers provide the tools to tackle real-world challenges in a strong academic environment. The Center for Precision Metrology, under the direction of the Mechanical Engineering Department, helps manufacturers of automobiles, airplanes and computer chips produce perfect parts through the aid of state-of-the-art measurement systems. Faculty from the Department of Civil Engineering are active participants in the university’s Global Institute for Energy and Environmental Systems. Its research focus is the intersection between energy production and the environment. The Electrical and Computer Engineering Department takes great pride in its research at UNC Charlotte’s Optoelectronics and Optical Communications Center. There, researchers are on a path to developing light-emitting silicon, smart integrated optical devices and advanced optical metrology.

Graduate Degree Programs
- Master of Engineering
- Master of Science in Engineering
- Master of Science in Civil Engineering
- Master of Science in Electrical Engineering
- Master of Science in Engineering Management
- Master of Science in Mechanical Engineering
- Ph.D. in Electrical Engineering
- Ph.D. in Mechanical Engineering

CIVIL ENGINEERING

Department of Civil Engineering
264 Smith Building
704-687-2304
http://www.ce.uncc.edu/

Degrees
- MSE, MSCE,
- Doctoral Study (Cooperative with NCSU)

Graduate Director
Dr. Jy S. Wu

Graduate Faculty
David Bayer, Professor and Associate Chairman
James Bowen, Assistant Professor
John Daniel, Assistant Professor
Jack Evett, Professor Emeritus
Janos Gergely, Assistant Professor
Johnny Graham, Associate Professor
Edd Hauser, Professor
Helene Hilger, Assistant Professor
Hilary Inyang, Duke Energy Distinguished Professor
Rajaram Janardhanam, Professor
Martin Kane, Associate Professor
Ellis King, Professor
Vincent Ogunro, Assistant Professor
Jy S. Wu, Professor
David Young, Associate Professor and Chairman

Program of Study
The Department of Civil Engineering provides opportunities for discipline-specific and multidisciplinary graduate-level education in civil engineering. Advanced course work and research are used to enhance professional development, improve technical competency, and provide a life-long learning experience. Doctoral studies leading to the degree of Doctor of Philosophy (Ph.D) are available through a cooperative arrangement with North Carolina State University (NCSU). The Department offers graduate studies in five areas of concentration: environmental and water resources engineering, geoenvironmental engineering, geotechnical engineering, structural engineering and structural materials, and transportation engineering.

Additional Admission Requirements
Admission requirements to the master’s program include an earned undergraduate degree in civil engineering or a closely related field, an undergraduate GPA of 3.0 or better, a satisfactory score from the Aptitude Portion of
the GRE, three letters of recommendation, a TOEFL score of 550 or better for international students, and any other appropriate credentials as required by the Graduate School. Admission requirements to the Ph.D. program include an earned master’s degree in engineering or a related field with GPA of 3.5 or better. Acceptance by both UNC Charlotte and NCSU constitute admission to this Ph.D program. The degree of Doctor of Philosophy is awarded by NCSU; however, the majority of course work and dissertation research can be conducted at UNC Charlotte.

Undergraduate students with outstanding academic performance may be admitted to the Early Entry Program to pursue graduate study while completing the undergraduate degree requirements. Students must have a minimum GPA of 3.2 and must have completed at least 75 hours toward the BSCE degree.

Conditional admission to the master’s program may be given to applicants with deficiencies in their civil engineering background.

Please note: Assistantships
Research and teaching assistantships and tuition remissions are available from the department on a competitive basis to highly qualified applicants/students.

Tuition Waivers
Tuition waivers available on a competitive basis for both out-of-state and in-state students.

Admission to Candidacy Requirements
Each student is required to submit a Plan of Study to the Department’s Graduate Director by the end of the second semester or before completing 18 hours of graduate credit.

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy.

Application for Degree
Each student should make application for degree prior to graduation.

Transfer Credit
The Department accepts the transfer of up to six hours of courses taken from another institution or UNC Charlotte prior to admission to the master’s program in civil engineering.

Core Courses
See course options for specific tracks. A minimum of 30 approved graduate credit hours including electives and thesis/research project is required for graduation. At least half of the semester hours must be in courses numbered 6000 or above. Both thesis and research project options exist. Six hours of thesis or three hours of project research are included in the 30-hour requirement.

Electives
Typically two graduate courses outside CEGR can be incorporated into the 30-1/2 hour requirement. However, an individual with a non-CEGR background may substitute the outside-CEGR courses with CEGR courses.

Track Descriptions

Recommended courses for the various tracks in environmental engineering are:

Water Resources: recommended core courses include any three of CEGR 5146, CEGR 5236, CEGR 6141 and CEGR 6147.

Treatment Process and Technology: recommended core courses include any three of CEGR 5142, CEGR 5143, CEGR 6144 and CEGR 6171.

Environmental Systems and Management: recommended core courses include any three of CEGR 5143, CEGR 6144 and CEGR 6171.

Geoenvironmental Engineering: recommended core courses include any three of CEGR 5145, waste containment systems, environmental geotechnics, and subsurface contaminant transport (course numbers to be provided).

Recommended courses in geotechnical engineering are:

Geotechnical engineering: CEGR 5264, CEGR 5270, CEGR 5271, CEGR 5272, CEGR 5278, CEGR 6252, CEGR 6268, and CEGR 6278.

Recommended courses for the two tracks in structural engineering are:

Structural analysis and design: CEGR 5108, CEGR 5121, CEGR 5123, CEGR 5124, CEGR 5222, CEGR 5224, CEGR 5226, CEGR 6126, CEGR 6127, CEGR 6128, and CEGR 6129.

Structural materials: CEGR 5108, CEGR 6090C, CEGR 6090S, CEGR 6127, and MEGR 6141.
Required core courses for transportation engineering are:

CEGR 5161, CEGR 6161, and one of the following: GEOG 6100, MATH 6107, or MATH 6172.

Advising
Each student will be supervised by his/her research advisor and a Program Committee.

Program Committee
The Program Committee shall consist of at least three graduate faculty. A graduate faculty from outside the CE department or from outside the student’s major area-of-study may serve as member of the Program Committee. The CE graduate research advisor shall serve as the chairman of the committee.

Capstone Experiences
Six graduate credits for thesis or three graduate credits for project are required as a part of the 30-hour requirement.

Thesis
M.S. Thesis or Research Project, see Capstone Experience.

Comprehensive Examination
Each student is required to make an oral presentation of his/her thesis or project and defend the thesis or project before his/her committee.

Research Opportunity/Experience
Students in civil engineering enjoy a curriculum with opportunities for interdisciplinary research, study abroad, and active participation in a growing research program. Programs of study can be tailored to suit individual needs and interests. The CE web site (http://www.ce.uncc.edu/) provides current areas of research conducted by the civil engineering faculty.

COOPERATIVE PH.D. PROGRAM IN ENGINEERING

The College of Engineering at UNC Charlotte has a cooperative arrangement with North Carolina State University (NCSU) to provide Ph.D. degree candidates located in Charlotte and enrolled in the Ph.D. program at NCSU with the opportunity to carry out most of their course work and dissertation research at UNC Charlotte. In addition to courses available at UNC Charlotte, selected doctoral-level courses from other participating institutions are available via the NC-REN telecommunications network.

Admission
Requirements for admission to the cooperative Ph.D. program are:
1) The student must have previously earned a master’s degree in engineering at UNC Charlotte or another accredited university.
2) The student must be accepted by a department in the UNC Charlotte College of Engineering.
3) The student must be accepted by the UNC Charlotte Graduate School.
4) The student’s academic interests must parallel those of a UNC Charlotte faculty member who has been appointed by NCSU as an adjunct faculty to the respective NCSU’s academic department or who is deemed eligible for such appointment.
5) The student must be sponsored and recommended for admission to the NCSU’s Ph.D. program by the department in which he or she has been accepted at UNC Charlotte. The student must be accepted by the NCSU Graduate School and the corresponding engineering department at NCSU. This acceptance by both UNCC and NCSU constitutes admission to the Ph.D. program which normally should be completed within the second semester of work beyond the master’s degree.

Degree Requirements
The degree of Doctor of Philosophy is to be awarded by NCSU to students who have accrued expanded knowledge beyond the master’s degree and have demonstrated the capability to undertake and accomplish significant research in a specialty area with a minimum of supervision. The specific degree requirements are available from the appropriate departments at North Carolina State University.

COURSES IN CIVIL ENGINEERING

CEGR 5090. Special Topics in Civil Engineering. (1-4) Study of specific new areas emerging in the various fields of civil engineering. May be repeated for credit. (On demand)

CEGR 5108. Finite Element Analysis and Applications. (3) Prerequisite: consent of department. Finite element method and its application to engineering problems. Application of displacement method to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics include but are not limited to dynamics, fluid mechanics, and structural mechanics. (Dual-listed with MEGR 5108.) (Spring)

CEGR 5121. Prestressed Concrete Design. (3) Prerequisites: CEGR 3225 and 4224 or consent of the department. Analysis and design of prestressed components and systems, including materials and systems for prestressing, loss of prestress, flexural and shear design in accordance with current building codes, analysis
of indeterminate prestressed systems, and control of camber, deflection and cracking. (Spring) (Alternate years)

CEGR 5123. Bridge Design. (3) Prerequisites: CEGR 3221 and 3225, or consent of the department. Review of bridge design codes and loadings; superstructure and substructure design of short, intermediate, and long span bridges constructed of steel and concrete; earthquake design; segmental and cable-stayed bridges. (Spring) (Alternate years)

CEGR 5124. Masonry Design. (3) Prerequisites: CEGR 3225 or consent of the department. Introduction of masonry materials and engineering and materials properties and testing procedures. Design of reinforced and unreinforced masonry (clay and concrete) walls, beams, and columns for vertical, wind, and seismic loads. Analysis and design of masonry structures (including torsion) and introduction to computer applications. (Spring) (Alternate years)

CEGR 5128. Matrix Methods of Structural Analysis. (3) Prerequisite: consent of department. Derivation of the basic equations governing linear structural systems. Application of stiffness and flexibility methods to trusses and frames. Solution techniques utilizing digital computer. (Fall) (Alternate years)

CEGR 5141. Process Engineering. (3) Prerequisite: CEGR 3141 or consent of the department. Applications of material and energy balance principles to the study of chemical, biological and environmental engineering processes. Overview of applied biotechnology, engineering thermodynamics and kinetics. (Fall)

CEGR 5142. Water/Wastewater Engineering. (3) Prerequisite: CEGR 3141 or consent of the department. Analysis and design of water and wastewater treatment processes including: physical, chemical and biological treatment. Computer-aided design of treatment systems. (Spring)

CEGR 5143. Solid Waste Management. (3) Prerequisite: CEGR 3141 or consent of the department. Solid waste management, sources, generation rates, processing and handling, disposal, recycling, landfill closures, and remedial actions for abandoned waste sites. (Spring) (Alternate years)

CEGR 5144. Engineering Hydrology. (3) Prerequisite: consent of the department. A quantitative study of the various components of the water cycle, including precipitation, runoff, ground water flow, evaporation and transpiration, stream flow. Hydrograph analysis, flood routing, frequency and duration, reservoir design, computer applications. (On demand)

CEGR 5145. Groundwater Resources Engineering. (3) Prerequisite: CEGR 3141 or consent of the department. Overview of hydrological cycle. Principles of groundwater flow and well hydraulics. Regional groundwater flow and flow nets. Water chemistry and contamination. Applications of groundwater modeling. (Fall) (Alternate years)

CEGR 5146. Advanced Engineering Hydraulics. (3) Prerequisite: CEGR 3143 or consent of the department. Problems of liquids as applied in civil engineering; open channel flow; dams and spillways; water power; river flow and backwater curves; pipe networks, fire flow, sewage collection, groundwater, computer applications. (On demand)

CEGR 5161. Advanced Traffic Engineering. (3) Prerequisite: CEGR 3161 or consent of the department. Analysis of basic characteristics of drivers, vehicles and roadway that affect the performance of road systems. Stream flow elements, volume, density, speed. Techniques of traffic engineering measurements, investigations and data analysis, capacity analysis. Intersections, accidents, parking. (On demand)

CEGR 5162. Transportation Planning. (3) Prerequisite: CEGR 3161 or consent of the department. Urban transportation; travel characteristics of urban transportation systems; analysis of transportation-oriented studies; analytic methods of traffic generation, distribution, modal split and assignment; traffic flow theory. (On demand)

CEGR 5167. Urban Public Transportation. (3) Prerequisite: CEGR 3161 or consent of the department. Planning, design, and operation of bus, rail, and other public modes. Relationship between particular modes and characteristics of urban areas. Funding, security and other administrative issues. (Fall) (Alternate years)

CEGR 5181. Human Factors in Traffic Engineering. (3) Prerequisite: CEGR 3161 or consent of the department. Study of the driver's and pedestrian's relationship with the traffic system, including roadway, vehicle and environment. Consideration of the driving task, driver and pedestrian characteristics, performance and limitations with regard to traffic facility design and operation. (On demand)

CEGR 5182. Transportation Environmental Assessment. (3) A study of the environmental impact analysis and assessment procedures for transportation improvements. Route location decisions. Noise, air quality, socio-economic, and other impacts. (On demand)

CEGR 5183. Traffic Engineering Studies. (3) Prerequisite: CEGR 3161 or consent of department. Introduction to the traffic engineering studies most used by traffic engineers including data collection techniques, statistical analysis procedures, report writing and presentation. One hour of lecture and three hours of laboratory per week. (On demand)
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite</th>
<th>Description</th>
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<tbody>
<tr>
<td>CEGR 5184</td>
<td>Highway Safety. (3)</td>
<td>Prerequisite: CEGR 3161 or consent of the department.</td>
<td>Engineering responses at the state and local levels to the problem of highway safety. Extent of the highway safety problem, elements of traffic accidents, common accident countermeasures, collection and analysis of accident data, evaluation of safety-related projects and programs, and litigation issues. (Fall) (Alternate years)</td>
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<tr>
<td>CEGR 5185</td>
<td>Geometric Design of Highways. (3)</td>
<td>Prerequisite: CEGR 3152 or consent of the department.</td>
<td>Theory and practice of geometric design of highways including intersections, interchanges, parking and drainage facilities. Driver ability, vehicle performance, safety and economics are considered. Two hours of lecture and three laboratory hours per week. (On demand)</td>
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<tr>
<td>CEGR 5222</td>
<td>Structural Steel Design II. (3)</td>
<td>Prerequisite: CEGR 3221.</td>
<td>Analysis and design of structural steel components and systems with emphasis on theories necessary for a thorough understanding of the design of complete structures. Compression members affected by local buckling, beams with lateral-torsional buckling, continuous beams and beam columns are covered. Welded and bolted connections. Current AISC Specifications used. (Spring)</td>
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<tr>
<td>CEGR 5224</td>
<td>Advanced Structural Analysis. (3)</td>
<td>Prerequisite: CEGR 3122 or consent of the department.</td>
<td>A continuation of CEGR 3122. Methods to determine deflections in structural members, including moment area, conjugate beam, virtual work, and Castigliano’s theorem. Methods to analyze statically indeterminate structures, including approximate force, slope deflection, moment distribution, and matrix stiffness methods. Project to compare analysis techniques and introduce use of structural analysis computer programs. (Fall)</td>
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<tr>
<td>CEGR 5226</td>
<td>Reinforced Concrete Design II. (3)</td>
<td>Prerequisite: CEGR 3225 or consent of the department.</td>
<td>Analysis and design of reinforced concrete components and systems with emphasis on the fundamental theories necessary for a thorough understanding of concrete structures. Concentrically loaded slender columns, slender columns under compression plus bending, Wall footings and column footings. Analysis of continuous beams and frames. Total design project involving the analysis and design of a concrete structure. Current ACI Specifications used. (Spring)</td>
</tr>
<tr>
<td>CEGR 5234</td>
<td>Hazardous Waste Management. (3)</td>
<td>Prerequisite: CEGR 3141 or consent of the department.</td>
<td>Integration of scientific and engineering principles with legislation, regulation and technology in the management of hazardous wastes. Study of thermal, chemical, physical and biological systems and processes used in the treatment of hazardous wastes and the remediation of hazardous waste sites. (On demand)</td>
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<tr>
<td>CEGR 5235</td>
<td>Industrial Pollution Control. (3)</td>
<td>Prerequisite: consent of the department. Source and characterization of industrial wastewaters. Fundamentals of chemical and physical treatment processes. Biological treatment technologies. Waste minimization and reduction technologies. Sludge handling and toxicity reduction. Implementation of field or laboratory treatability study. (Fall) (Alternate years)</td>
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<tr>
<td>CEGR 5236</td>
<td>Watershed Analysis. (3)</td>
<td>Prerequisite: consent of the department. Study of NPS problems in urban and non-urban watersheds and from highway runoff. Estimate of sediment yield and design of BMP’s including sediment control structures. Introduction to monitoring and modeling of hydrologic systems. Watershed modeling in a GIS environment. (Spring) (Alternate years)</td>
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<tr>
<td>CEGR 5237</td>
<td>Environmental Risk Management. (3)</td>
<td>Prerequisite: consent of the department. Review of legislation and requirements pertaining to spills and releases of chemicals to the environment. Fundamentals of fires, explosions, toxic emissions and dispersion, hazardous spills, and other accidents. Study of techniques for accident prevention and spill control, and hazardous and risk assessment. (Fall) (Alternate years)</td>
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<tr>
<td>CEGR 5241</td>
<td>Chemical Processes in Water and Wastewater Treatment. (3)</td>
<td>Prerequisites: CHEM 1252 (Formerly CHEM 1102) and CEGR 3141, or consent of the department. Chemical principles involved in the treatment of water and wastewaters; principles of chemical equilibrium relevant to natural water systems; the nature and effect of chemical interactions of domestic and industrial waste effluents on natural water systems. (On demand)</td>
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<tr>
<td>CEGR 5243</td>
<td>Topics in Environmental Health. (3)</td>
<td>Prerequisite: consent of the department. Study of contemporary environmental health problems and practices as they relate to groundwater pollution, food and water-borne diseases, radiological health, occupational health and risk assessment. Provides an introduction to epidemiology and toxicology, and a historical review of federal environmental policy and legislative action. (On demand)</td>
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<tr>
<td>CEGR 5262</td>
<td>Traffic Engineering. (3)</td>
<td>Prerequisite: CEGR 3161 or consent of the department.</td>
<td>Operation and management of street and highway systems. Traffic control systems, traffic flow theory, and highway capacity. Evaluation of traffic engineering alternatives and the conduct of traffic engineering studies. (Spring)</td>
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<tr>
<td>CEGR 5264</td>
<td>Landfill Design and Site Remediation. (3)</td>
<td>Prerequisites: CEGR 3258 and 3278, or consent of the department. Principles of waste disposal and sanitary landfill siting including design, construction, operation and maintenance. Site assessment of underground storage tank leaks; site remediation, and clean up technologies. (On demand)</td>
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using choice and economic analysis and computer applications. (Spring) (Alternate years)

CEGR 5270. Earth Pressures and Retaining Structures. (3) Prerequisites: CEGR 3122 and 3278 or consent of the department. Earth pressure theories, effects of wall friction and external loads (including earthquake); design of rigid retaining walls (including structural details); sheetpile wall design; soil reinforcement systems for retaining structures; computer applications. (On demand)

CEGR 5271. Pavement Design. (3) Prerequisites: CEGR 3161 and 3278, or consent of the department. Pavement design concepts and considerations; engineering properties of pavement materials including soils, bases, asphalt concrete, and portland cement concrete; design of flexible and rigid pavements including shoulders and drainage; computer applications for pavement analysis and design. (On demand)

CEGR 5272. Design with Geosynthetics. (3) Prerequisites: CEGR 3258 and 3278 or consent of the department. Types and properties of geosynthetics. Designing with geosynthetics for filtration, separation, drainage, soil reinforcement, stabilization, containment, and erosion control. Computer applications in design. (Fall) (Alternate years)

CEGR 5278. Geotechnical Engineering II. (3) Prerequisites: CEGR 3258 and 3278, or consent of the department. Design of shallow and deep foundations, including structural considerations; lateral earth pressure theories; design of rigid and flexible earth retaining structures; advanced aspects of slope stability analysis; and computer applications. (Fall)

CEGR 5892. Individualized Study and Projects. (1-6) Prerequisites: consent of the department. Individual investigation and exposition of results. May be repeated for credit. (On demand)

CEGR 5991. Graduate Research in Civil Engineering. (1-4) Prerequisite: consent of the department. Independent study of a theoretical and/or experimental problem in a specialized area of civil engineering. May be repeated for credit. (On demand)

The 6000-level courses for advanced graduate courses

CEGR 6090. Special Topics in Civil Engineering. (1-6) Directed study of current topics of special interest. May be repeated for credit. (On demand)

CEGR 6122. Advanced Topics in Structural Steel. (3) Prerequisites: CEGR 4222 or consent of the department. Theory of plastic behavior of steel structures; current topics in structural steel. (On demand)

CEGR 6126. Analysis of Plates and Shells. (3) Prerequisite: CEGR 4224, or consent of the department. Analysis of rectangular and circular plates using classical as well as numerical methods; orthotropic and continuous plates and plate buckling. Analysis of thin shells and shells of revolution with and without bending; membrane theory of cylindrical shells; symmetric and unsymmetric loading; pipes, tanks, and pressure vessels; computer applications. (On demand)

CEGR 6127. Fracture Mechanics and Fatigue. (3) Prerequisites: CEGR 3221 or consent of the department. Introduction to fracture mechanics and fatigue, including Griffith Theory, plan strain-stress conditions, critical stress intensity factors, factors influencing fracture toughness, fracture mechanics design principles, fatigue performance, and fatigue initiation and propagation. (On demand)

CEGR 6128. Structural Optimization. (3) Prerequisites: CEGR 4224, or consent of the department. Introduction to optimization concepts; reformulation of common structural analysis and design problems to an optimization format; optimization of constrained, unconstrained, linear, and nonlinear problems by classical and numerical techniques; and computer applications. (On demand)

CEGR 6129. Structural Dynamics. (3) Prerequisite: CEGR 3122 or consent of the department. Methods for dynamic analysis of single and multiple degree of freedom systems. Topics include free vibrations, dynamic response of simple structures under time dependent loads (e.g., harmonic, periodic, impulsive, general dynamic loading), support motion, frequency domain analysis, response spectra, earthquake engineering. (On demand)

CEGR 6141. Water Quality Modeling. (3) Prerequisite: consent of the department. Mathematical modeling of water quality in receiving streams including: generation of point and nonpoint sources of pollution; formulation of transport equations for contaminants in stream and estuarine water; and prediction of the fate, persistence and transformation of chemical pollutants in aquatic ecosystems. Computer model simulation and case studies. (On demand)

CEGR 6142. Bioenvironmental Engineering. (3) Prerequisites: CEGR 3141 or consent of the department. Theoretical principles and design of aerobic and anaerobic biological unit processes for renovating waters and wastewaters. Activated sludge, aerated and facultative lagoons, rotating biological contractors, trickling and anaerobic filters. (On demand)

CEGR 6143. Bioprocess Technology. (3) Prerequisites: CEGR 4141 and general microbiology, or consent of the department. Introduction to metabolic pathways, growth kinetics and reactor theories. Laboratory investigations of the operation, optimization and scale-up problems associated with batch and continuous culture of microorganisms. Process analysis and modeling of environmental engineering processes. (Spring)
CEGR 6144. Environmental Biotechnology. (3)
Prerequisite: Consent of the department. Application of biotechnology to the management of environmental problems. Study of bioprocess principles, bioremediation of waste disposal sites, cell immobilization technology and innovative biotechnologies. (On demand)

CEGR 6145. Waste Incineration. (3) Prerequisite: consent of the department. Fundamentals of incineration of hazardous/solid wastes. Thermochemical applications and equipment design. Computer modeling of the incineration process and air quality control. (Spring)


CEGR 6148. Water Conservation. (3) Prerequisites: Consent of the department. Principles and issues concerning water conservation and methods for effecting water conservation, including residential, industrial, commercial, and agricultural water conservation; water rates, audits and reuse/reclamation as they relate to water conservation; and case studies. (On demand)

CEGR 6161. Traffic Control and Operation. (3) Prerequisite: CEGR 5161 or consent of the department. Traffic control theory and application; traffic regulation, laws and ordinances; speed control, intersection control, flow control and parking control; design and application of control devices, investigation, evaluation techniques; statistical analysis; administration. (On demand)

CEGR 6165. Urban Systems Engineering. (3) Prerequisite: CEGR 3202 or consent of the department. Survey of economic, political, sociological and technological factors affecting modern growth; a planning process and its role in solving selected urban problems with emphasis on engineering contributions. (On demand)

CEGR 6171. Air Quality Control. (3) Prerequisite: consent of the department. Study of various types of air pollutants, their sources, nature and effects. Examination of air quality criteria, standards and monitoring. Analysis of feasibility, applicability and efficiency of diverse systems of control. Evaluation of goal and research needs in the future. (On demand)

CEGR 6172. Air Dispersion Modeling. (3) Prerequisites: Consent of the department. Atmospheric pollution problems, federal regulations, boundary layer meteorology, dispersion theory, gaussian model, plume rise formulas, air toxics, and computer modeling of point area, line and mobile sources. (On demand)

CEGR 6173. Environmental Aquatic Chemistry. (3) Prerequisite: CHEM 3111 or CHEM 3141, or equivalent, or consent of the department. Concepts of chemical equilibria applied to natural aquatic systems. Topics include acid-base reactions, buffer systems, mineral precipitation, coordinate chemistry, redox reactions, adsorption phenomena and chemical-equilibria computer programs. (Spring) (Alternate years)

CEGR 6181. Traffic Flow Theory. (3) Prerequisite: CEGR 5161 or consent of the department. Logical foundations and mathematical representation of traffic flow; interrelation between microscopic and macroscopic equations of motion for highway traffic; stochastic properties of traffic at low and moderate densities. Car-following theories of traffic flow at high densities. Applications of queuing theory. (On demand)

CEGR 6182. Transportation Systems Analysis. (3) Prerequisite: CEGR 5161 or consent of the department. Issues, concepts and methods of transportation systems engineering and planning. Decision making in transportation management. The application of analytical methods to the development and evaluation of transport systems. (On demand)

CEGR 6252. Soil Dynamics and Earthquake Engineering. (3) Prerequisites: CEGR 3122 and 3278, or consent of department. Review of the dynamics of single and multi degree of freedom systems. Earthquake mechanism, distribution, magnitude, intensity, ground shaking, site effects, prediction, and response spectra. Soil liquefaction; aseismic design of foundations; seismic codes; and machine foundation design. (On demand)

CEGR 6261. Traffic Signal Control Systems. (3) Prerequisite: CEGR 6161 or consent of the department. Study of control systems for isolated intersections, arterial streets, closed networks, and freeways. Emphasis on computer models; state-of-the-art detection, control, and communications equipment and software; and intelligent vehicle/highway systems. (Fall)

CEGR 6268. Advanced Soil Mechanics. (3) Prerequisites: CEGR 3258 and 3278, or consent of the department. One and two-dimensional consolidation, layered strata effects, and creep; seepage in layered strata, flow net, and seepage forces; shear strength parameters, effective and total stress paths, and application for slope stability evaluation; principles of critical state soil mechanics; computer applications. (On demand)

CEGR 6892. Individualized Study and Projects. (1-6) Individual investigation and exposition of results. May be repeated for credit. (On demand)
CEGR 6991. Graduate Master Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. (On demand)

CEGR 7999. Master’s Degree Residence (1) Required for continuing registration and enrollment while completing thesis or research project. May be repeated. (On demand)

ELECTRICAL ENGINEERING

Department of Electrical and Computer Engineering
332 Smith Building
(704) 547-2302
http://www.ece.uncc.edu

Degrees
M.S.E.E, M.S.E, and Ph.D.

Director
Dr. Rafic Z. Makki

Graduate Faculty
Falih H. Ahmad, Assistant Professor
David Binkley, Professor
Steve Bobbio, Professor
Robert Coleman, Professor
Kasra Daneshvar, Professor
Michael Feldman, Associate Professor
Richard Greene, Professor
Mohamed-Ali Hasan, Associate Professor
Yogendra P. Kakad, Professor
Vasilije Lukic, Professor
Rafic Makki, Professor
Mehdi Miri, Associate Professor
Asis Nasipuri, Assistant Professor
Howard Phillips, Professor
Barry Sherlock, Associate Professor
William Smith, Professor Emeritus
Charles Stroud, Professor
Farid Tranjan, Professor
Raphael Tsu, Professor
Sheng-Guo Wang, Associate Professor
Tom Weldon, Assistant Professor

The department is staffed with a reputed multidisciplinary faculty conducting research in areas ranging from control systems to optoelectronics. A full range of state-of-the-art laboratories is available enabling faculty and students to conduct research at the cutting edge of technology.

MASTER'S PROGRAMS IN ELECTRICAL ENGINEERING

Program Objectives
The Masters programs are designed to provide technical expertise in a specific area of electrical and computer engineering as well as breadth of knowledge in supporting areas. The thesis option provides the students the opportunity to work on a research project that culminates in the publishing of a thesis. The non-thesis option is designed to provide additional breadth in areas that support the chosen focus area. It is also the goal of the program to graduate engineers with effective problem solving and communication skills.

M.S.E.E. and M.S.E. Degree Requirements
The M.S.E.E. degree is awarded to those students with a B.S.E.E. degree who complete the M.S. program in Electrical and Computer Engineering. The M.S.E. degree is awarded to those students with a bachelor’s degree in a field other than Electrical and Computer Engineering who complete the M.S. program in Electrical and Computer Engineering. Normally, students entering the M.S.E. program are required to take undergraduate preparatory courses in Electrical and Computer Engineering.

Thesis
Both thesis and non-thesis options exist.

Degree Requirements for the Thesis Option
1) Plan of Study - the student must meet with his/her advisor to formulate a plan of study. The plan of study must be submitted after completing at least 9 but no more than 18 semester credits.

2) Satisfactory completion of 30 hours of approved graduate credits. This includes:
   a) 21 hours of courses in the major and related areas of study, and
   b) 9 hours of thesis.

3) Admission to candidacy - the admission to candidacy form must be completed prior to the thesis defense or oral examination. The student should consult the schedule of classes for deadlines on submitting this form for Fall or Spring graduation.

4) Thesis Defense - a copy of the thesis should be distributed to each member of the program committee at least one week prior to the defense.
Degree Requirements for the Non-Thesis Option

1) Plan of Study - the student must meet with his/her advisor to formulate a plan of study. The plan of study must be submitted after completing at least 9 but no more than 18 semester credits.

2) Satisfactory completion of 30 hours of approved graduate credits. This includes 21 hours of courses in the major (at least 15 of which must be in the ECE department).

3) Essay - this can take several forms. For example it could be a survey of a number of research papers, a report on a small development project that the student undertakes, etc. The essay topic will be assigned by the advisor. The final written report will be approved by the student’s advisory committee (a majority of the committee members) via signatures of the committee members on the report.

4) Admission to candidacy - the admission to candidacy form must be completed prior to the thesis defense or oral examination. The student should consult the schedule of classes for deadlines on submitting this form for Fall or Spring graduation.

5) Oral Exam - this will be administered by the program advisory committee.

Program Committee

The program committee is composed of at least 3 members of the graduate faculty, the majority of whom must be members of the Electrical and Computer Engineering department. The graduate program advisor generally serves as the chairman of the committee.

PH.D. IN ELECTRICAL ENGINEERING

Program Objectives

The Ph.D. program is designed to provide the students with research-level expertise in a focus area within electrical and computer engineering and breadth of knowledge in areas related to the focus area. It is also designed to graduate scientists that can effectively articulate their ideas, publish their research and obtain funding for their programs and ideas. To that end, we place value on the big-picture perspective of electrical and computer engineering.

Degree Requirements

The following is a chronologically ordered set of requirements for the Ph.D. degree in Electrical Engineering:

1) Appointment of a Ph.D. advisor and formation of an advisory committee.

2) Development of a Ph.D. Plan of Study detailing all course and examination requirements.

3) Successful completion of the written qualifying examination.

4) Presentation of a proposal for Ph.D. research and admission to candidacy.

5) Successful defense of the Ph.D. Dissertation.

Within the first semester of being admitted into a Ph.D. program, the student should choose a Ph.D. adviser and form an advisory committee. In conjunction with the Ph.D. adviser and this advisory committee, the student will develop a Plan of Study to meet the Ph.D. program requirements of course work and examinations and prepare to undertake original research leading to a dissertation of a quality that would be acceptable for publication of articles in peer-refereed professional journals.

Plan of Study

The Plan of Study must be submitted to the Chair of the Department for review and approval within the second semester after admission to the Ph.D. program. The Plan of Study must show a minimum of 72 hours of credit beyond the Baccalaureate degree, including at least 45 hours of formal course work beyond the baccalaureate degree and at least 18 hours of research/dissertation credits (beyond the M.S. thesis credits). For students who do not possess appropriate bachelor's and/or master's degrees in engineering, additional course work will be expected.

Course Requirements

The specific course requirements will be set by the student's Advisory Committee and must include:

1) At least 30 hours within the major field of study, no less than 18 of which must be in courses at the 8000-level, open only to Ph.D. students.

2) Two minors consisting of at least 6 hours each in related fields of study.

3) Graduate Only Courses. At least 18 hours in the major field must be in courses at the 8000-level. At least 12 of those hours must be taken after admission to the Ph.D. program.

Grades

A student is expected to achieve A's or B's in all course work taken for graduate credit and must have a GPA of at least a 3.0 in order to graduate. The dissertation is graded on a Pass/ Unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U on any course, enrollment will be terminated. A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or summer session unless properly readmitted to the graduate program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the student's major department and the Engineering
Residence
A student may satisfy the residency requirement for the program by completing 18 hours, either course work or research credits, by study-in-residence during the academic year and during the summer terms, as long as the study is continuous. Study-in-residence is deemed to be continuous if the student is enrolled in one or more courses (including research/dissertation credit) in successive semesters until eighteen hours of credit are earned.

Qualifying Examination
In addition to demonstrating a high level of competence in course work, the student must pass a comprehensive written qualifying examination in the major and minor areas. The qualifying examination should be taken before completion of 18 hours beyond the master's degree in the major and minor areas but must be passed no later than one year after initial admission to the program. Failure to pass the qualifying examination in two tries will result in the termination of the student's enrollment in the Ph.D. program.

Ph.D. Qualifying Examination Format
The qualifying exam is divided into two test sessions. The first session covers primarily senior level courses, and the second session covers primarily first-year graduate courses in ECE.

In each session, the student chooses four problems only from a set of problems covering different areas. In session 1, a maximum of two problems can be selected from a given area. In session two, at least one problem must be chosen from the minor course listing which is external to the ECE department (note minors can be within or outside ECE but at least one must be outside ECE). For a detailed listing of courses and areas, visit the ECE Department WWW site at "www.ece.uncc.edu."

Dissertation Proposal and Admission to Candidacy
Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. The proposal must be presented to and orally defended before the student's advisory committee. The proposal must be presented within one year after the qualifying examination is passed. Upon approval of the student's dissertation proposal, the advisory committee will recommend the student's admission to candidacy subject to the approval of the engineering Doctoral Graduate Committee and the Dean of the Graduate School.

Dissertation
Evidence of a high degree of competence in scholarship, written exposition, independent inquiry and the ability to organize and apply knowledge must be demonstrated by the student in the dissertation. The student will make a public defense of the dissertation at which time the dissertation, as well as the student's knowledge of the field, will be appropriate matter for examination by the student's advisory committee. Although questions may be asked by the general audience, evaluation of the dissertation defense is the sole responsibility of the advisory committee. The dissertation will be graded on a Pass/Unsatisfactory basis.

Research Tool Requirements
Each student is expected to develop working knowledge of the library tools used in literature search and review in the major field of concentration. This would include familiarity with at least one of the computer-based databases available at UNC Charlotte. In addition, each student is expected to have a working knowledge of at least one computer language appropriate for the field of inquiry. The student will have a working knowledge of appropriate major software packages and will have the ability to develop original software as needed.

Time Limit
Students are allowed a maximum of eight (8) calendar years from formal admission to the Ph.D. program to complete the program successfully.

Tuition Waivers
For exceptionally qualified candidates, in state tuition and out-of-state tuition differential waivers are available.

Assistantships
Teaching Assistantships are awarded for exceptional students. Application forms are available on the ECE Web site or can be obtained from the department office.

Courses in Electrical and Computer Engineering
ECGR 5090. Special Topics. (1-6) Directed study of current topics of special interest. May be repeated for credit. (On demand)

ECGR 5101. Advanced Computer Utilization. (3) Prerequisite: consent of department. The use of computers in large scale engineering problems. Topics include flow diagrams, matrix analysis of systems, applications of iteration methods to non-linear problems, eigen-value problems, optimization and handling of large engineering database problems. Engineering applications will be emphasized. (On demand)

ECGR 5102. Engineering Simulation. (3) Prerequisite: ECGR 2103 or consent of department. A wide range of
simulation related topics will be introduced including the theory of simulation, characteristics of simulators, and trade-offs in simulation studies. Continuous and discrete simulation with primary emphasis on application of simulation techniques to engineering problems. Simulation of actual problems based on students’ interest and experience areas. (On demand)

ECGR 5103. Applied Computer Graphics. (3)
Prerequisite: permission of department. Interactive graphics; raster, character, vector, graphics, display technologies; rotation, scaling, translating of graphics image; image processing/enhancement; feature extraction; 3-D graphics; hidden lines. (On demand)

ECGR 5104. Computational Methods in Power Systems. (3) Prerequisite: ECGR 4142 or consent of department. Numerical techniques for analysis, operation and planning of power systems. Sparse matrix techniques applied to power flow algorithms. Economic operation of power systems. Optimum power flow. (On demand)

ECGR 5111. Control Systems. (3) Prerequisite: consent of department. Mathematical models and characteristics of control systems. Performance and stability of linear feedback systems. Root locus and frequency response techniques. Stability in frequency domain. Time domain analysis. Design and compensation of control systems. Credit will not be given for ECGR 5111 where credit has been given for ECGR 4111. (Fall) (Evenings)


ECGR 5114. Device Characterization, Parameterization and Modeling. (3) Prerequisite: ECGR 3132 and ESGR 4134 or permission of department. Advance device and circuit analysis; device and circuit simulation using SPICE, ECAP or equivalent. Parametric modeling of active devices. Device characterization and parameterization; temperature effects; thermal cycling. Analysis of device failure modes. (On demand)

ECGR 5121. Antennas. (3) Prerequisite: ECGR 3122 with a grade of C or better or permission of the department. Radiation into free space, the point source, thin linear antenna, arrays of linear elements, aperture antennas, impedance, methods of feeding, matching and termination. Antenna systems. (On demand)

ECGR 5122. Random Processes and Optimum Filtering. (3) Prerequisites: ECGR 3111 and STAT 3228 or permission of department. Review of probability, univariate and multivariate distribution functions; random processes, discrete and continuous time processes, widenses stationary, ergodicity; time-and frequency-domain analysis; linear systems, optimum filtering, Wiener filters, Kalman filters; application. (Spring)

ECGR 5123. Advanced Electromagnetic Field Theory. (3) Prerequisite: ECGR 3122 or permission of department. Maxwell’s equations and propagation. Properties of guided and surface waves. Wave properties of light; physical and fiber optics. (On demand)

ECGR 5124. Digital Signal Processing. (3) Prerequisite: EEGR 3112 with a grade of C or better. Sampling and signal recovery in linear systems; analysis of sampled systems; discrete and fast Fourier transforms; z-transform; discrete convolution; design of digital FIR and IIR filters. (Spring)

ECGR 5125. Optical Signals and Networks. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computed tomography, and optical processing. (On demand)

ECGR 5132. Advanced Analog Integrated Circuit Electronics. (3) Prerequisite: consent of department. Topics include analog amplifier design, layout and simulation of analog circuits, active filters, analog processing, process control, electronic power supplies, reliability, noise and low-level signal processing. (On demand)

ECGR 5133. VLSI Systems Design. (3) Prerequisite: ECGR 2181 and 3131 or permission of department. Analysis, design, and synthesis of very large scale integrated circuits. A project-oriented course relying heavily on computer-aided design tools for logic, layout design, and simulation. (Fall) (Evenings)

ECGR 5134. Advanced VLSI Systems Design. (3) Prerequisite: ECGR 5133. A project-oriented course dealing with advanced topics in VLSI systems design and analysis such as circuit design techniques, array structures, performance estimation, automated routing and device electronics. (Spring)

ECGR 5135. Physical Electronics. (3) Prerequisite: ECGR 3122 or PHYS 3181 or permission of department.
Dynamics of charged particles; electron motion in electromagnetic fields; types of electron emission; beam focusing; longitudinal and transverse beam waves; microwave generation; plasma parameters. (On demand)

ECGR 5137. Device Electronics for Integrated Circuits. (3) Prerequisites: ECGR 3132 and ESGR 4134, or permission of department. The basic operating principles of electronic devices in integrated circuits are treated. The physical models of these devices are discussed. Graduate students are required to carry out laboratory experimentation. (Fall) (Evenings)

ECGR 5138. Electronic Thin Film Materials and Devices. (3) Prerequisite: ECGR 4133 or 3132, or permission of the department. Applications of thin films in microelectronics/optoelectronics manufacturing processes; vacuum technology, deposition techniques, and the characterization methods relevant to optoelectronic applications; thin film applications such as metallization, silicide formation, light emitting diodes (LED) and lasers, and doping of semiconductors. (Fall)

ECGR 5139. Digital Communication Systems. (3) Prerequisites: ECGR 2181 and 3131. Topics include digital data transmission systems, signal and system representation, digital system performance characterization, pulse code modulation, and statistical communications theory. (On demand)

ECGR 5140. Introduction to VLSI Processing. (3) Prerequisite: permission of the department. Microelectronic fabrication; relevant materials, processes, and tools; fabrication of a simple structure in the VLSI clean room/lab. (Fall)

ECGR 5141. Unsymmetrical Analysis of Power Systems. (3) Prerequisite: ECGR 4142 or consent of department. Application of symmetrical components to the calculation of overcurrents and overvoltages during unsymmetrical faults. Characterization of generators, transformer banks and transmission lines for unsymmetrical analysis. Methods for grounding the system neutral. (On demand)


ECGR 5143. Dynamic and Transient Analysis of Power Systems. (3) Prerequisite: ECGR 4142 or permission of department. Large-scale systems state descriptions and hierarchical control. State space models, dynamic stability and testing. Stability of simple and multi-machine systems. Transient phenomena in electrical power systems. Transient stability problem. (Spring) (Alternate years) (Evenings)

ECGR 5146. Introduction to VHDL. (3) Prerequisites: ECGR 2182 and knowledge of a computer language, or permission of department. Introduction to VHDL—Hardware Description Language (VHDL) including VHDL-based high-level design of microelectronic systems, VHDL programming, and VHDL synthesis; emphasis on learning and using industry-standard VHDL tools running on VNIKX workstations. (Fall)

ECGR 5161. Control of Robotic Manipulators. (3) Prerequisites: ECGR 4161 and 4111. Control of industrial robots including linear, nonlinear, and adaptive control of robot’s motion plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuator and sensor types, robot vision, and control computer/robot interfacing (dual-listed with MEGR 5128). (Spring)

ECGR 5165. Laser Electronics. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of department. Laser oscillation, excitation, amplification, dispersion, absorption, basic principles of quantum electronics, and general characteristics of lasers. Semiconductor lasers switching and modulation, photovoltaic and photodetectors. Ray tracing in an optical system, Gaussian beams in continuous media, and nonlinear optics, CW and pulsed lasers, Q-switching, mode locking, electrical and opto-electronic engineering aspects of laser technology. Basic spectroscopy, applications to semiconductor fabrication, and surface processing. (On demand)

ECGR 5181. Computer Arithmetic. (3) Prerequisite: permission of department. Principles, architecture and design of fast two operand adders, multi-operand adders, standard multipliers and dividers. Cellular array multipliers and dividers. Floating point processes, BCD and excess three adders, multipliers and dividers. (On demand)

ECGR 5182. Digital System Testing. (3) Prerequisite: ECGR 2181 with a grade of C or better or permission of department. System testing; Boolean difference; D-algorithm; checking experiments; redundancy, computer-aided digital test systems. (Spring)

ECGR 5187. Data Communications. (3) Prerequisite: consent of department. Principles of data communication; computer communications architecture (layering) with emphasis on the physical layer and data link layer, transmission media; analog and digital signal representation; data transmission basics; Shannon’s theorem; error detection/correction; data compression; point-to-point protocols; multiplexing. (Fall)

ECGR 5190. Acoustics. (3) Prerequisite: ECGR 3122 or PHYS 4231. Vibrations and simple vibrating systems; radiating systems; plane waves of sound; dynamic analogies, microphones and other acoustic transducers; acoustic measurements. (On demand)

ECGR 5191. Analog and Digital Communication. (3) Prerequisite: ECGR 3111. Analysis and transmission of signals including analog communication systems (amplitude and frequency modulation, effect of noise); digital communications systems (pulse code modulation, data transmission systems phase-shift keying and frequency-shift keying, effect of noise). (Fall) (Evenings)

ECGR 5192. Solid State Microelectronics II. (3) Prerequisites: ECGR 3122 and 4133 each with a grade of C or better. Advanced device concepts for MOSFET, bipolar, and CMOS integrated circuits. Gate length, transit time, and power-frequency limits. Device scaling concepts. Tunneling and avalanche devices, and hot electron behavior. Device and interconnect reliability and failure and device interconnects. Submicron channel, MODFET, and quantum well devices. High frequency solid state devices. Limits of switching speed. Solid state power devices. (Spring)

ECGR 5193. Power System Analysis I. (3) Prerequisite: ECGR 3142 with a grade of C or better. Representation of power system components for analysis studies. Transmission line parameters. Network equations. Load flow analysis and numerical methods. (Fall)

ECGR 5194. Power System Analysis II. (3) Prerequisite: ECGR 4141 with a grade of C or better. Economic operation of power systems. Short circuit studies. Symmetrical components. Transient stability analysis. (Spring)

ECGR 5195. Electrical Machinery. (3) Prerequisite: ECGR 3142 with a grade of C or better. Advanced theory of transformers and rotating. Machines; harmonic and saturation effects on machine performance. Unbalanced operation and transient conditions. (On demand)

ECGR 5196. Introduction To Robotics. (3) Prerequisites: ECGR 2103 or MEGR 2101 and senior standing. Modeling of industrial robots including homogeneous transformations, kinematics, velocities, static forces, dynamics, computer animation of dynamic models, motion trajectory planning, and introduction to vision, sensors and actuators (dual-listed with MEGR 4127). (Fall)

ECGR 5197. Fundamentals of Optical Engineering. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of the department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computer tomography and optical processing. (On demand)

ECGR 5231. Materials for Electro-Optical Engineering. (3) Prerequisite: ECGR 4125 or permission of department. Methods of processing, growth, and device structuring for electro-optical and optical engineering: crystalline, polycrystalline, ceramic, glass, and polymer synthesis and processing to produce desire optical properties for magneto-optical devices and their use in electronic memories; synthesis, drawing, cladding, coupling, and doping of optical fiber devices. (Fall)

ECGR 5261. Microwave Circuit Design I. (3) Prerequisites: ECGR 3131 and graduate standing, or permission of department. Design and analysis of microwave devices and circuits; including microwave aspects of discrete active (i.e., field effect and bipolar transistors, etc.) and passive (i.e., microstrips, inductors, capacitors) components; device parameter extraction, using computer aided design (CAD) tools. (Fall)

ECGR 5265. Microwave Devices and Electronics. (3) Prerequisites: ECGR 3122 and PHYS 2231 with grades of C or better or permission of department. Microwave transmission line theory, parameters, microwave waveguides, microstrip line and components including resonators, slow-wave structures, tees, rings, couplers, circulators, isolators, and microwave tubes. Microwave solid state electronics including microwave transistors, tunnel diodes, transferred electron devices, avalanche transit-time devices, and mono-lattice microwave integrated circuits. (On demand)

ECGR 5411. Control Systems Theory I. (3) Prerequisite: ECGR 3111 with a grade of C or better. Transfer functions, block diagrams and signal flow graphs. Feedback control system characteristics. The performance and stability of feedback systems using root locus and frequency response methods. Time domain analysis of control systems. The design and compensation of control systems. (Fall)

ECGR 5412. Control Systems Theory II. (3) Prerequisite: ECGR 4111 with a grade of C or better. State space techniques and useful state space methods. System stability. Controllability and observability of linear
systems. The formulation of the state equations for discrete-time systems and the analysis of these systems by matrices. Analysis of nonlinear systems. Optimal control systems studies. (Spring)

ECGR 5431. Linear Integrated Electronics. (3)
Prerequisite: ECGR 3132 with a grade of C or better. Design of linear integrated circuits utilizing bipolar and MOS devices. Application in linear amplifier design, control and processing of analog signals. Power supply regulators, analog switches, and active filters. (Fall)

ECGR 5892. Individualized Study. (1-6) Individual investigation and exposition of results. May be repeated for credit. (On demand)

ECGR 6021. Advanced Topics in EM and Applications. (3) Prerequisite: permission of department. Possible topics include: advanced boundary value problems; non-linear magnetic materials; wave guides and resonant cavities; magneto-hydrodynamics and plasmas; relativistic effects; charged particle dynamics; radiation. (On demand)

ECGR 6090. Special Topics. (1-6) Directed study of current topics of special interest. May be repeated for credit. (On demand)

ECGR 6101. Advanced Computer Graphics. (3) Prerequisites: ECGR 5103 and 5133 or permission of department. A project-oriented course using and developing techniques of CAD/CAM graphics, hardware and software development. Advanced application of graphics in computer-aided systems design. (On demand)

ECGR 6102. Optimization of Engineering Designs. (3) Prerequisite: ECGR 5101 or consent of department. The development of computationally feasible algorithms for solving optimization problems in engineering designs. Introduction to non-linear programming methods; study of constrained and unconstrained problems, linear programming problems and other related topics. (On demand)

ECGR 6111. Systems Theory. (3) Prerequisite: ECGR 4112 or consent of department. State space concepts and solutions. Introduction to theory of deterministic linear systems. Application of matrix methods and vector difference equations to lumped parameter electrical mechanical and fluid systems, and discrete time systems. Frequency domain techniques in signal and systems analysis. Computer simulation of system dynamics. (Fall) (Evenings)

ECGR 6112. Digital Control Systems. (3) Prerequisites: ECGR 6111 and 4181 or consent of department. Time-domain and Z-domain analysis of linear discrete systems, open and closed loop sampled data systems, engineering characteristics of computer control systems, simulation of system dynamics. (Spring, Alternate years)

ECGR 6114. Digital Signal Processing II. (3) Prerequisite: permission of department. Discrete Hilbert Transforms, discrete random signals, effect of finite register length in digital and signal processing, speech processing, radar and other applications. (Spring, Alternate years) (Evenings)

ECGR 6115. Optimal Control Theory I. (3) Prerequisite: ECGR 6111 or permission of department. Optimum control of continuous-time and discrete time systems. The Maximum Principle and Hamilton Jacobi Theory. Theory of optimal regulator, state estimation and Kalman Bucy Filter. Combined estimation and control--the Linear Quadratic Gaussian Problems. Computational methods in optimum control systems. (Fall, Alternate years) (Evenings)

ECGR 6116. Optimal Control Theory II. (3) Prerequisite: ECGR 6115 or permission of department. A continuation of ECGR 6115 with emphasis on stochastic systems. Optimal filtering. Discrete-time Kalman filter and Kalman filter properties. Parameter identification. Multi-variable control systems, system sensitivity and robustness. (Spring, Alternate years) (Evenings)

ECGR 6117. Multivariable Controls. (3) Prerequisites: ECGR 6111. Problem of robustness controls, emphasizing computer-oriented approaches; high infinity and algebraic methods current developments. (On demand)

ECGR 6118. Applied Digital Image Processing. (3) Cross-listed with CSCI 6134. Digital image fundamentals; comparison of image transforms including Fourier, Walsh, Hadamard and Cosine; image data compression techniques; image enhancement algorithms; image restoration; image encoding process; image segmentation and description; relationship of hardware restrictions to image fidelity. (On demand)

ECGR 6121. Advanced Theory of Communications I. (3) Prerequisite: introductory probability course or permission of department. Statistical communications theory and modern communications systems emphasizing modulation and methods of taking into account the effects of noise on various systems. (Fall, Alternate years) (Evenings)

ECGR 6122. Advanced Theory of Communications II. (3) Prerequisite: ECGR 6121 or permission of department. Continuation of ECGR 6121 including coding and decoding methods. Wave form communications. Applications. (Spring, Alternate years) (Evenings)

ECGR 6125. Optoelectronic Information Processing. (3) Prerequisite: ECGR 5125 with a grade of B or better or permission of department. Spatial light modulation including magneto-optic and electro-optic light modulators, optical bistable devices and logic gates, optical processing components such as array detectors.
and Charge Couple Devices (CCD), multiple-value logic, systolic processors and optical logic arrays, symbolic computing, optical interconnects, holographic elements and artificial intelligence, optical implementation of neural computers. (Spring)

ECGR 6127. Medical Ultrasonics. (3) Prerequisite: ECGR 3122 or PHYS 4231 with grade of C or better, or permission of department. Acoustic wave propagation in fluids and solids, acoustic impedances, acoustic radiators and beam profiles; piezoelectricity, piezoelectric ceramics and polymers, integrated ultrasound transducers, design and testing of medical ultrasound transducers; hyperthermia, imaging, tissue characterization. (Spring)

ECGR 6131. Hybrid Microelectronics. (3) Prerequisite: ECGR 5132 or permission of department. A project-oriented course involving design, bonding, interconnect and testing of a multicide hybrid microelectronics circuit. Emphasis placed upon use of I.C.'s of various technologies in these designs to optimize performance. (On demand)

ECGR 6132. Advanced Semiconductor Device Physics. (3) Prerequisite: ECGR 5137 or permission of the instructor. A review of semiconductor physics, bipolar and unipolar devices, photonic devices and methods of measuring specific device characteristics. (Spring)

ECGR 6133. MOS Physics and Technology. (3) Prerequisite: ECGR 6132 or permission of the instructor. The theoretical and practical aspects of the metal oxide semiconductor (MOS) system, its electrical properties, and the measurement and the technology for their control. These topics are developed from simple beginnings to the current state of the art. (Fall)

ECGR 6138. Physical Design of VLSI Systems. (3) Prerequisite: ECGR 5133 or equivalent. Synthesis and design of high-speed VLSI circuits; state-of-the-art approaches for circuit simulation; models and techniques for VLSI physical design. (Spring)

ECGR 6141. Power System Relaying. (3) Prerequisite: ECGR 5141 or permission of department. Function and principles of protective relaying instrument transformers. Directional, distance and differential relays. Protection of generators, transformers, and transmission lines. Ground fault protection. Computer relaying, algorithms for protective relaying. (On demand)

ECGR 6142. Voltage Transients and Surge Protection. (3) Prerequisite: ECGR 5141 or permission of department. Overvoltages due to lightning and switching surges. Traveling waves on transmission lines. Surge arrestors, insulation coordination. Surge protection of transmission lines, substations and rotating machine. Shielding and grounding. (On demand)


ECGR 6146. Advanced VHDL. (3) Prerequisite: ECGR 5146 or permission of department. Continuation of ECGR 5146. FPGA design with VHDL; VHDL modeling libraries and techniques, and VHDL coding methodology for efficient synthesis. (Spring)

ECGR 6151. Advanced Microelectronics Projects. (3) Prerequisite: ECGR 5133. Project-oriented course for the advanced microelectronics student to pursue the testing and simulation at various levels (component, gate, cell and system), as well as the design of a significant VLSI implementation. (On demand)

ECGR 6156. Application Specific Integrated Circuit Design. (3) Prerequisite: ECGR 5133 or permission of the department. Basic concepts, techniques and CAD tools in Application Specific IC Designs (ASIC); technology of ASIC circuits, method of design, CAD tools, and simulation and verification; practical aspects of design. (Fall)

ECGR 6171. Simulation of Electronic Materials. (3) Prerequisites: PHYS 6142/ECGR 6162 and PHYS 4271/ECGR 4171. Tight-binding theory of periodic solids; bond orbital theory applied the linear and non-linear optical properties of insulators and semiconductors; calculation of vibrational spectra; Green’s Function methods for amorphous solids. Simulation of electrically active defects in solids. (On demand)

ECGR 6183. Multiprocessor Systems Design. (3) Prerequisites: ECGR 3184 and 5131. Topics include applications of multiprocessors to digital systems design; hardware/software tradeoff considerations; master/slave, multiple/master and loosely coupled systems; data handling and synchronization problems, networking. (On demand)

ECGR 6184. Computer System Engineering. (3) Prerequisite: consent of department. Topics include data formats, register transfer operations, computer organization, microprogram control and ALU design. Arithmetic algorithms, I/O organization and memory organization are also covered. Specific emphasis is placed throughout on tradeoffs between hardware and software. (On demand)

ECGR 6185. Advanced Microprocessor-Based Design. (3) Prerequisite: CSCI 4181 or permission of department. An advanced course in computer design utilizing 16-bit microprocessors. Architecture, software,
and interface techniques. This course is project-oriented, involving the use of a logic analyzer. *(Fall) (Evenings)*

**ECGR 6186. Design for Testability.** *(3)* Prerequisite: ECGR 2181 or permission of department. Fault modeling; test generation using the D-algorithm, PODEM, and FAN; partitioning; scan design, built-in self-testing; testing of array logic; and fault tolerance. Project-oriented course involving the use of logic and fault simulation tools. *(Spring) (Evenings)*

**ECGR 6187. Modeling and Analysis of Communication Networks.** *(3)* Prerequisite: Probability theory or consent of the department. Communication networks; application of analytical tools for modeling and performance evaluation of these networks, including stochastic processes, Markov models, queuing theory, and teletraffic theory. *(Spring)*

**ECGR 6261. Microwave Circuit Design II.** *(3)* Prerequisite: ECGR 5261, or permission of the department. Design/analysis of: (1) microwave low-noise, (2) power amplifier and (3) up/down converter circuits; circuit design examples from cellular and Personal Communications Systems (PCS); microwave and mm-wave circuit techniques. *(Spring)*

**ECGR 6890. Individualized Study and Projects.** *(1-6)* Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

**ECGR 6991. Graduate Master Thesis Research.** *(1-6)* Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

**ECGR 8021. Advanced Topics in EM and Applications.** *(3)* See ECGR 6021 for Course Description.

**ECGR 8090. Special Topics.** *(1-6)* See ECGR 6090 for Course Description.

**ECGR 8101. Advanced Computer Graphics.** *(3)* See ECGR 6101 for Course Description.

**ECGR 8102. Optimization of Engineering Designs.** *(3)* See ECGR 6117 for Course Description.

**ECGR 8111. Systems Theory.** *(3)* See ECGR 6111 for Course Description.

**ECGR 8112. Digital Control Systems.** *(3)* See ECGR 6112 for Course Description.

**ECGR 8114. Digital Signal Processing II.** *(3)* See ECGR 6114 for Course Description.

**ECGR 8115. Optimal Control Theory I.** *(3)* See ECGR 6115 for Course Description.

**ECGR 8116. Optimal Control Theory II.** *(3)* See ECGR 6116 for Course Description.

**ECGR 8117. Applied Artificial Intelligence.** *(3)* See ECGR 6117 for Course Description.

**ECGR 8118. Applied Digital Image Processing.** *(3)* See ECGR 6118 for Course Description.

**ECGR 8121. Advanced Theory of Communications I.** *(3)* See ECGR 6121 for Course Description.

**ECGR 8122. Advanced Theory of Communications II.** *(3)* See ECGR 6133 for Course Description.

**ECGR 8125. Optoelectronic Information Processing.** *(3)* See ECGR 6125 for Course Description.

**ECGR 8127. Medical Ultrasonics.** *(3)* See ECGR 6127 for Course Description.

**ECGR 8131. Hybrid Microelectronics.** *(3)* See ECGR 6131 for Course Description.

**ECGR 8132. Advanced Semiconductor Device Physics.** *(3)* See ECGR 6132 for Course Description.

**ECGR 8133. MOS Physics and Technology.** *(3)* See ECGR 6133 for Course Description.

**ECGR 8138. Physical Design of VLSI Systems.** *(3)* See ECGR 6138 for Course Description.

**ECGR 8141. Power System Relaying.** *(3)* See ECGR 6141 for Course Description.

**ECGR 8142. Voltage Transients and Surge Protection.** *(3)* See ECGR 6142 for Course Description.

**ECGR 8143. Power System Control.** *(3)* See ECGR 6143 for Course Description.

**ECGR 8146. Advanced VHDL.** *(3)* See ECGR 6146 for Course Description.

**ECGR 8151. Advanced Microelectronics Projects.** *(3)* See ECGR 6151 for Course Description.

**ECGR 8156. Application Specific Integrated Circuit Design.** *(3)* See ECGR 6156 for Course Description.

**ECGR 8171. Simulation of Electronic Materials.** *(3)* See ECGR 6171 for Course Description.

**ECGR 8183. Multiprocessor Systems Design.** *(3)* See ECGR 6183 for Course Description.

**ECGR 8184. Computer System Engineering.** *(3)* See ECGR 6184 for Course Description.
ECGR 8185. Advanced Microprocessor-Based Design. (3) See ECGR 6185 for Course Description.

ECGR 8186. Design for Testability. (3) See ECGR 6186 for Course Description.

ECGR 8187. Modeling and Analysis of Communication Networks. (3) See ECGR 6187 for Course Description.

ECGR 8261. Microwave Circuit Design II. (3) See ECGR 6261 for Course Description.

ECGR 8890. Individualized Study and Projects. (1-6) See ECGR 6890 for Course Description.


ENGINEERING MANAGEMENT

Engineering Management Program
233 Smith
704-687-3989
http://www.coe.uncc.edu/mem/home.htm

Degree
M.S.

Coordinator
S. Gary Teng

Graduate Faculty
Douglas Ramers, Assistant Professor, Engineering Management
J. William Shelnutt, Professor, Engineering Management
S. Gary Teng, Associate Professor, Engineering Management
Jack B. Evett, Professor, Civil Engineering
Johnny R. Graham, Associate Professor, Civil Engineering
L. Ellis King, Professor, Civil Engineering
Jy Shing Wu, Professor, Civil Engineering
David T. Young, Associate Professor, Civil Engineering
Edwin Braun, Associate Professor, Engineering Technology
Keh-Hsun Chen, Associate Professor, Computer Science
Junsheng Long, Associate Professor, Computer Science
Zbigniew Michalewicz, Professor, Computer Science
Zbigniew Ras, Professor, Computer Science
Kalpathi R. Subramanian, Associate Professor, Computer Science
A. Barry Wilkinson, Professor, Computer Science
Bei-Tseng Chu, Professor, Software and Information Systems
Mirsad Hadzikadic, Associate Professor, Software and Information Systems
William J. Tolone, Assistant Professor, Software and Information Systems
Douglas Cooper, Professor, Business Information Systems and Operations Management
Moutaz Khouja, Associate Professor, Business Information Systems and Operations Management
Ram L. Kumar, Associate Professor, Business Information Systems and Operations Management
Cem Saydam, Professor, Business Information Systems and Operations Management
Anthony C. Stylianou, Associate Professor, Business Information Systems and Operations Management
Kent E. Curran, Professor, Management

Program of Study
The Engineering Management Master of Science Degree program prepares professionals for careers in managing projects, programs, systems, and organizations. Industrial, research, consulting, and commercial firms now demand engineering managers with both cutting-edge technical competence and the management skills necessary to forge linkages with the systems and business sides of these organizations. These managers must be able to form and manage high performance teams and manage business and technological operations. The program of study is necessarily multidisciplinary, combining elements of advanced study in various engineering disciplines with studies of business and system operations and organizational behavior.

Additional Admission Requirements
1) Either a bachelor’s degree in engineering or a closely related technical or scientific field, or a bachelor’s degree in business, provided relevant technical course requirements have been met. It is expected that some students in the second category will have a major in business and a minor in engineering.
2) Undergraduate coursework in engineering economics (or equivalent).
3) Integral and differential calculus (MATH 1120 and 1121 at UNC Charlotte).
4) Statistics (STAT 2122 or STAT 3128 at UNC Charlotte).
5) An average grade of 3.0 (out of 4) on items 2,3, and 4 above.

Documents to be submitted for admission
1) Transcript(s) showing a baccalaureate degree in engineering, engineering technology, or a scientific discipline, or a baccalaureate degree in business administration from an accredited college or university.
2) A satisfactory score on the General Test of the Graduate Record Examination (depending on the student’s background, the Graduate Management
Admission Test, GMAT, may be substituted in certain cases).
3) Written descriptions of any relevant and significant work experience.
4) If the applicant’s native language is not English, an overall score of 575 (old system) or 230 (new computer-based examination) in the Test of English as a Foreign Language (TOEFL).

**Degree Requirements**
Thirty semester hours of approved graduate work within one of two options:

**Option 1:** Successful completion of 30 semester hours of graduate-level coursework.

**Option 2:** Successful completion of 24 semester hours of graduate-level coursework and 6 hours of thesis research.

The curriculum consists of six core courses and four additional courses (or two courses with the thesis option) selected from an approved list of electives. Students are expected to complete a Plan of Study that identifies a concentration such as Manufacturing Management or Systems Management.

**Required Core Courses:**

1) **EMGT 6980** Industrial and Technology Management Seminars. (1) (EMGT students must have three credits in this course.)

2) Three courses from among the following:
   - **EMGT6142** Quality and Manufacturing Management (3)
   - **EMGT6901** Advanced Project Management (3)
   - **EMGT6902** Legal Issues in Engineering Management (3)
   - **EMGT6904** Product and Process Design (3)
   - **EMGT6906** Processing Systems Simulation (3)
   - **EMGT6950** Engineering Systems Integration (3)
   - **EMGT6955** Systems Reliability Engineering (3)
   - **EMGT6985** Engineering Management Project (3)

3) Two courses from among the following:
   - **MBAD6141** Operations Management (3)
   - **MBAD6161** Organizational Leadership and Behavior I (3)
   - **MBAD6164** Executive Communications (3)
   - **MBAD6195** Strategic Management of Technology (3)

**Note:** Students will be required to have adequate preparation prior to taking the required MBAD (Master in Business Administration) courses. Normally this will consist of at least completion of courses in engineering economics, foundations of economics, and mathematics through differential and integral calculus. Students will be advantaged by having completed courses in foundations of accounting and statistics.

**Interdisciplinary Elective Courses** (or two courses with thesis option) from the above lists, or approved by your advisor from courses such as:

- **EMGT6905** Designed Experimentation (3)
- **ECGR6121** Advanced Theory of Communications I (3)
- **ECGR6122** Advanced Theory of Communications II (3)
- **ECGR6187** Modeling and Analysis of Communication Networks (3)
- **ITSC6352** Information Technology and Electronic Commerce (3)
- **CSCI6160** Database Systems, Design and Management (3)
- **CSCI6164** Design and Implementation of On-line Management Information Systems (3)
- **CSCI6166** Computer Communications and Networks (3)
- **MEGR7282** Computer Aided Process Planning (3)
- **MEGR7118** Thermal Environmental Engineering (3)
- **MEGR7127** Computer-Aided Manufacturing (3)
- **CEGR5234** Hazardous Waste Management (3)
- **CEGR6165** Urban Systems Engineering (3)
- **CEGR6171** Air Quality Control (3)
- **MBAD 6122** Technology-Enhanced Decision Making (3)
- **MBAD 6124** Business Information Systems Development (3)
- **MBAD 6191** Entrepreneurship (3)

Other graduate courses may be taken as elective courses for the engineering management degree with approval of the program coordinator.

**Courses in Engineering Management**

**EMGT 6090. Special Topics.** (1-6) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*.

**EMGT 6142. Quality and Manufacturing Management.** (3) Provides an in-depth study of current issues and advances in manufacturing management. Topics include just-in-time inventory management, total quality management, statistical process control, continuous improvement, flexible manufacturing systems, computer-integrated manufacturing, technology evaluation and selection, and manufacturing strategy. Emphasis on use of computers for decision support. *(On demand)*

**EMGT 6890. Individual Study.** (1-6) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

**EMGT 6901. Advanced Project Management.** (3) Prerequisite: Consent of Instructor. Study of various aspects of project management including project types and organizations, regulatory and liability issues, planning,
budget, risk assessment, and conflict resolution. Exercises involve research into emerging management processes, use of computerized techniques, and application of management theories in team-based projects. (On demand).

EMGT 6902. Legal Issues in Engineering Management. (3) Survey of legal issues surrounding engineering products and services, including warranty, liability, contracting, intellectual property, codes, and accepted practice. Legal principles, precedents, case studies, and research projects. (On demand)

EMGT 6904. Product and Process Design. (3) Application of principles of creative problem solving to design of products and processes by multi-disciplinary teams. Taking as the definition of design "the communication of a set of rational decisions for accomplishing stated objectives within prescribed constraints," the teams produce elements of designs for various products and services at points in the sequential stages of design. Teams make periodic reports and presentations to the class on design assignments. (On demand)

EMGT 6905. Designed Experimentation. (3) Prerequisites: Statistics and consent of instructor. Design of quality into products and processes using statistically designed experimentation (DOE), a systematic and efficient method of design optimization for enhanced performance, quality, and cost. Emphasis on designing and conducting useful experiments rather than the basis in statistical theory. Includes robust parameter design and tolerance design techniques. Review and comparison of Taguchi methods with conventional designed experimentation. Extensive use of specialized computer software to design experiments and analyze results in team projects; screening experiments, and sequential response surface methods. (On demand)

EMGT 6906. Processing Systems Simulation. (3) Prerequisite: Statistics. Principles and application of selecting, planning, and executing simulation projects for processing systems, and developing and experimenting with simulation models. Discrete event simulation is particularly powerful for modeling and experimenting with systems exhibiting interdependencies and variability such as manufacturing and service systems. Students will learn simulation project management, modeling, and experimenting using commercial simulation software products. (On demand)

EMGT 6950. Engineering Systems Integration. (3) Prerequisite: Consent of Instructor. This course is an introduction to the relevant issues and required techniques for successful systems design development, integration, management, and implementation. Principles and methods for system life-cycle analysis, system planning and management, and systems integration. Interfaces between the system, subsystems, the environment, and people. Students will learn the factors to control the total system development process designed to ensure a high quality and effective system. (On demand)

EMGT 6955. Systems Reliability Engineering. (3) Prerequisites: Calculus and Statistics. Introduction of concepts and methods for the design, testing and estimation of component and system reliabilities. Topics include: reliability mathematics; analysis of reliability data; reliability prediction and modeling; reliability testing; maintainability and availability; failure mode and effects analysis and failure rates; reliability design and implementation; application of concurrent engineering and reliability methods to integrate reliability tests into the overall system development cycle to reduce overall life cycle costs. (On demand)

EMGT 6980. Industrial and Technology Management Seminars. (1) Prerequisite: Consent of Instructor. A series of seminars covering current management issues, challenges and practices in industrial, government, and business sectors of industry. May be repeated for credit. (All students in the Engineering Management MS Program are required to take this course for three semesters.) (Full, Spring)

EMGT 6985. Engineering Management Project. (3) Prerequisite: EMGT 6901 and two other program required EMGT courses. This course will offer a hands-on real world industrial/business project. The emphasis will be on the design and implementation of effective methods on the development and/or improvement of products, processes, procedures, or systems. A 3-member project committee includes a faculty project advisor, the industrial project advisor, and a faculty member in the technical area has to be established before taking this project course. This project will be a capstone project for the students in the Engineering Management Master of Science Program. (On demand)

EMGT 6991. Graduate Master Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. (On demand)

EMGT 7999. Graduate Residence. (1) Required for continuing registration and enrollment while completing thesis or research project. (On demand).
MECHANICAL
ENGINEERING AND
ENGINEERING SCIENCE

Department of Mechanical Engineering and
Engineering Science
245 Smith Building
704-687-2303
http://www.mees.uncc.edu/gprogram/grad.html

Degree
M.S.M.E., M.S.E., Ph.D.

Director of Graduate Programs
Dr. Robert G. Wilhelm

Graduate Faculty
Harish P. Cherukuri, Assistant Professor
Robin N. Coger, Assistant Professor
James F. Cuttino, Associate Professor
Matthew A. Davies, Associate Professor
Paul H. DeHoff, Professor Emeritus
Horacio V. Estrada, Associate Professor
Yogeshwar Hari, Professor
Robert J. Hocken, Norvin Kennedy Dickerson Jr.
    Distinguished Professor
Robert E. Johnson, Professor
Russell G. Keanini, Associate Professor
Rhyn H. Kim, Professor Emeritus
Harry J. Leamy, Professor
Charles Y. Lee, Assistant Professor
Gerald J. Micklow, Associate Professor
Ganesh P Mohanty, Bonnie E. Cone Distinguished
    Professor
Edward P. Morse, Assistant Professor
Edgar G. Munday, Associate Professor
Steven R. Patterson, United Dominion Industries
    Distinguished Professor
Jayaraman Raja, Professor
K. Scott Smith, Professor
Stuart T. Smith, Professor
S. Gary Teng, Associate Professor
Robert G. Wilhelm, Associate Professor

Andrew Brown, Adjunct Associate Professor
Mark C. Malburg, Adjunct Assistant Professor
Richard D. Peindl, Adjunct Professor
Mano J. Thubrikar, Adjunct Professor

The department of Mechanical Engineering and
Engineering Science offers degree programs leading to
the Master of Science in Mechanical Engineering
(MSME), the Master of Science in Engineering (MSE),
and the Doctor of Philosophy (Ph.D.). At the Master's
level, the program is broad based, allowing students to
develop expertise in a number of areas including design,
manufacturing, thermal and fluid sciences, solid
mechanics, bioengineering, materials engineering and
science, and mechanical control and instrumentation. The
Ph.D. program is more closely focused on precision
engineering and manufacturing, computational modeling,
and bioengineering. The graduate program is supported
by a world class metrology laboratory, numerous graduate
research and computer labs in the Cameron Applied
Research Center, core and specialized biotechnology
laboratories, and a first rate machine shop managed by a
group of highly skilled lab and shop personnel. The
William States Lee College of Engineering also supports a
network of engineering computer laboratories.

MASTER'S PROGRAMS IN
MECHANICAL
ENGINEERING AND
ENGINEERING SCIENCE

Program of Study
The Department of Mechanical Engineering and
Engineering Science offers programs of study and
research leading to the Master of Science in Mechanical
Engineering (M.S.M.E.) and the Master of Science in
Engineering (M.S.E.). The M.S.M.E. program of study is
for students who have completed a B.S.M.E. degree while
the M.S.E. degree offers a more generic program of study
for students who may not possess a baccalaureate degree
in engineering.

The objectives of the M.S.M.E. and M.S.E. program are as
follows.
- To provide our students with the opportunity to
develop a breadth of knowledge in mechanical
engineering so that they can adapt to the
changing requirements of the technological
workplace.
- To produce graduates who are able to practice
as mechanical engineers with advanced skills and
serve state, regional, and national industries.
- To prepare graduates for personal and
professional success, both as individuals and in
team environments.

Additional Admission Requirements
Applicants must demonstrate evidence of satisfactory
undergraduate preparation in engineering, usually
manifested by the possession of a baccalaureate degree
from an accredited institution in some area of
engineering, with a grade point average of at least 3.0 on a
4.0 scale. Special consideration may be given to
candidates with substantial engineering work experience.

Applicants with baccalaureate degrees from fields other
than engineering (e.g., biology, physics, chemistry,
may be considered for admission to graduate study. Typically these applicants complete mathematics, science, and engineering courses, as determined by the Director of Graduate Programs, before entering the graduate program.

The applicant must receive a satisfactory score on the verbal and quantitative sections of the Graduate Record Examination General Test.

Acceptability for admission is based upon the applicant's record and background as determined by the department.

**Early-Entry to Graduate School**
Exceptional undergraduate students at UNC Charlotte may be accepted into the graduate program and begin work toward a graduate degree before completion of the baccalaureate degree. An applicant may be accepted at any time after completion of 75 or more hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken.

To be accepted into this program, an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test and have earned an acceptable score. If any early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work.

Up to six hours earned at the graduate level may be substituted for required undergraduate hours. (Up to six hours of graduate work may be "double counted" toward both baccalaureate and graduate degrees.)

**Degree Requirements**
The applicant must complete at least 30 approved graduate credit hours as prescribed by the graduate advisor and fulfill the following:

- A minimum of 18 semester hours in Mechanical Engineering and/or Engineering Science.
- The completion of one mathematics course (3 hrs), and three core courses (9 hrs).
- Students pursuing the thesis or creative design project option may complete up to 6 hours of thesis research.
- Students pursuing the problem report option may complete up to 3 hours of problem report.
- Students pursuing the coursework-only option must satisfactorily complete a comprehensive exam that is administered by the advisory committee.

The decision as to whether a program will include a thesis, design project or problem report is to be made on an individual basis by the advisory committee at the time of filing the Student's Plan of Study.

**Academic Standards**
Only the grades of A, B or C are accepted towards a graduate degree. A grade of U in any graduate course will terminate the student's enrollment subject to readmission as prescribed in the University catalog. Similarly, an accumulation of three C grades will result in termination of the student's enrollment, subject to readmission to a program. A student in any graduate program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record and actions with regard to observance of University rules and regulations.

**Admission to Candidacy Requirements**
Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy on a form supplied by The Graduate School. This application is a checklist approved by the advisor, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative date for the comprehensive examination should be agreed upon and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

The student and faculty advisor will agree on the appointment of an advisory committee. The advisory committee will be composed of at least three graduate faculty members. The graduate advisor will serve as chair of the committee. The committee is recommended by the department after appropriate consultation between the advisor and student.

**Core Courses**

**Mathematics** (1 course from list):
- MATH 6171 Advanced Applied Mathematics I
- MATH 6172 Advanced Applied Mathematics II
- MATH 6103 Computer Techniques and Numerical Methods

Any 6000 level math course approved by the thesis advisor.

**ME Core Courses** (3 courses from list):
- MEGR 6125 Vibrations of Continuous System
- MEGR 6141 Theory of Elasticity I
- MEGR 6166 Mechanical Behavior of Materials I
- MEGR 6181 Engineering Metrology
MEGR 7110 Advanced Conductive Heat Transfer  
or  
MEGR 7115 Convective Heat Transfer

**Electives** (4 courses for thesis option), (5 courses for problem report option):  
Any 6000 or 7000 level mechanical engineering course or any graduate level course from the departments of Electrical and Computer Engineering, Physics, Chemistry, Biology, and Computer Science may be taken with the advisor’s approval.

**Transfer Credit**  
Courses taken at any of the participating institutions are considered part of the program and are not treated as transfer courses. At the time of admission, up to six hours of transfer credit may be accepted from an ABET accredited engineering institution.

**Assistantships**  
Teaching and research assistantships are available on a competitive basis.

**Tuition Waivers**  
In-state and Out-of-state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

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**PH.D. PROGRAM IN MECHANICAL ENGINEERING AND ENGINEERING SCIENCE**

**Program of Study**  
The Department of Mechanical Engineering and Engineering Science offers multi-disciplinary programs leading to a Ph.D. degree in mechanical engineering in the areas of biomedical engineering (BME), computational modeling and simulation (CMS), and precision engineering and manufacturing (PE).

The objectives of the Ph.D. program are as follows.
- To provide our students with the opportunity to develop a breadth of knowledge in mechanical engineering so that they can adapt to the changing requirements of the technological workplace.
- To develop engineering researchers who can contribute to the development of new knowledge and the dissemination of best practices in academic, industrial, and government environments.

- To prepare graduates for personal and professional success, both as individuals and in team environments.

**Additional Admission Requirements**  
In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Ph.D. program in Mechanical Engineering:
1) A master's degree in engineering or a closely allied field with a GPA of at least 3.5. Exceptional students with only a baccalaureate degree may also be considered for admission to the Ph.D. program.
2) The applicant must receive a satisfactory score on the verbal and quantitative sections of the Graduate Record Examination General Test.
3) Three letters of reference, at least two of which must be from faculty members. All three must be from professionals working in the applicant's field of interest.

Acceptability for admission is based upon the applicant's record and background as determined by the department.

**Degree Requirements**  
1) Appointment of a Ph.D. advisor and formation of an advisory committee.
2) Development of a Ph.D. Plan of Study detailing all course and examination requirements.
3) Successful completion of the written qualifying examination.
4) Presentation of a proposal for Ph.D. research and admission to candidacy.
5) Successful defense of the Ph.D. Dissertation.

Within the first semester of being admitted into a Ph.D. program, the student should choose a Ph.D. advisor and form an advisory committee. In conjunction with the Ph.D. advisor and this advisory committee, the student will develop a Plan of Study to meet the Ph.D. program requirements of course work and examinations and prepare to undertake original research leading to a dissertation of a quality that would be acceptable for publication of articles in peer-refereed professional journals.

**Plan of Study**  
The Plan of Study must show at least 72 hours of credit beyond the baccalaureate degree including at least 18 hours of research/dissertation credits. For students who do not possess appropriate bachelor’s and/or master’s degrees in engineering, additional course work will be expected. The specific course requirements will be set by the student's advisory committee but must include: At least 30 hours within the major field of study, and two minors consisting of at least 6 hours each in related fields of study. The Plan of Study must be submitted to the Chair of the Department for review and approval within the second semester after admission to the Ph.D. program.
Residence
A student may satisfy the residency requirement for the program by completing 18 hours, either course work or research credits, by study-in-residence during the academic year and during the summer terms, as long as the study is continuous. Study-in-residence is deemed to be continuous if the student is enrolled in one or more courses (including research/dissertation credit) in successive semesters until eighteen hours of credit are earned.

Grades
A student is expected to achieve A's or B's in all course work taken for graduate credit and must have a GPA of at least 3.0 in order to graduate. The dissertation is graded on a Pass/Unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal C grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U in any course, enrollment will be terminated. A student whose enrollment has been terminated because of grades is ineligible to attend any semester or summer session unless properly readmitted to the graduate program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the student's major department and the Engineering Doctoral Graduate Committee of the College of Engineering.

Qualifying Examination
In addition to demonstrating a high level of competence in course work, the student must pass a comprehensive written qualifying examination in the major and minor areas. The qualifying examination should be taken before completion of 18 hours beyond the master's degree in the major and minor areas but must be passed no later than one year after initial admission to the program. Failure to pass the qualifying examination in two tries will result in the termination of the student's enrollment in the Ph.D. program.

Admission to Candidacy Requirements
The single requirement for admission to candidacy is the appointment of an advisory committee. This committee will consist of at least three graduate faculty members, one of whom shall be from a department other than the student's major, with the graduate advisor serving as chair of the committee. The committee is recommended by the department after appropriate consultation between the advisor and student.

Dissertation Proposal and Admission to Candidacy
Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. Upon approval of the student's dissertation proposal, the advisory committee will recommend the student's admission to candidacy. This is subject to the approval of the Dean of the Graduate School.

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy on a form supplied by The Graduate School. This application is a checklist approved by the advisor, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative date for the dissertation defense should be agreed upon by the candidate and chair and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

Dissertation
Evidence of a high degree of competence in scholarship, written exposition, independent inquiry and the ability to organize and apply knowledge must be demonstrated by the student in the dissertation. The student will make a public defense of the dissertation at which time the dissertation, as well as the student's knowledge of the field, will be appropriate matter for examination by the student's advisory committee. Although questions may be asked by the general audience, evaluation of the dissertation defense is the sole responsibility of the advisory committee. The dissertation will be graded on a Pass/Unsatisfactory basis.

Assistantships
Teaching and research assistantships are available on a competitive basis.

Tuition Waivers
In-state and Out-of-state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

Time Limit
Students are allowed a maximum of eight (8) calendar years from formal admission to the Ph.D. program to complete the program successfully.

COURSES IN MECHANICAL ENGINEERING AND ENGINEERING SCIENCE

Core Courses
MEGR 6090. Special Topics. (1-6)
(For Post-Baccalaureate Students only) Directed study of current topics of special interest. May be repeated for credit. (On Demand)

MEGR 6116. Fundamentals of Heat Transfer and Fluid Flow. (3) Prerequisite: MEGR 3114 or consent of
the department. A unified treatment of transfer operations developed in terms of physical rate processes; formulation and solution of typical boundary value problems associated with heat, mass and momentum transfer. (Spring)

MEGR 6125. Vibrations of Continuous Systems. (3) Prerequisite: MEGR 4143. Analysis of vibration of continuous linear elastic structures such as strings, rods, beams and plates with varying boundary conditions. Approximate solution techniques such as Rayleigh, Rayleigh-Ritz and Galerkin are presented. (Spring)

MEGR 6141. Theory of Elasticity I. (3) Prerequisite: MEGR 3221 or consent of the department. Introduction to the theory of elastic media; the fundamentals of stress, strain, stress-strain relationships, compatibility and equilibrium. Applications to two- and three-dimensional problems. Structural mechanics and energy methods. (Fall)

MEGR 6166 Mechanical Behavior of Materials I. (3) Prerequisite: MEGR 3161 or equivalent or consent of the department. Macroscopic and microscopic aspects of elastic and plastic deformation and fracture of engineering materials; applications of dislocation theory to an interpretation and control of mechanical properties; temperature, strain rate and texture effects. (Spring)


MEGR 7101. Transport Processes. (3) Prerequisite: Consent of instructor. Unified field theory approach to the fluid transport of momentum, energy, mass and electrical charge. Statistical theories of turbulence and molecular transport. Multiphase systems, chemically reacting flows, ionized fluids, separation processes. (On Demand)

MEGR 7102. Intro to Continua. (3) Prerequisites: MEGR 2144, MEGR 3114, or consent of instructor. A unified treatment of those topics which are common to all continua. Stress, deformation and velocity fields, constitutive equations and field equations. Representative applications in solid, fluid and electromagnetic continua, including interaction problems. (On Demand)

MEGR 7108. Finite Element Analysis and Applications. (3) Prerequisites: MEGR 6141 and MATH 6171 or permission of department. An introduction to the finite element method and its application to engineering problems. Application of the displacement methods to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics may include but are not limited to: dynamics, heat conduction, and structural mechanics. (Dual-listed with CEGR 5108). (Spring)

MEGR 7111. Advanced Engineering Thermodynamics. (3) Prerequisites: MEGR 3112 and MATH 3142. Postulational treatment of the laws of thermodynamics. Equilibrium and maximum entropy postulates. Development of formal relationships and principles for general systems. Applications to chemical, magnetic, electric, and elastic systems. (On Demand)

MEGR 7112. Radiative Heat Transfer. (3) Prerequisite: MEGR 3116. Fundamentals of radiation heat transfer, analysis of gray body and wavelength dependent systems; radiation from gases at high temperature, and particulate-laden gases; combined radiation and conduction. (On Demand)

MEGR 7113. Dynamics and Thermodynamics of Compressible Flow. (3) Prerequisites: MEGR 3111 and 3114. Compressible flow equations, isentropic flow, normal shock waves, Fanno and Rayleigh line flows. Nonsteady one dimensional flow. (Alternate Years)

MEGR 7114. Advanced Fluid Mechanics. (3) Prerequisite: MEGR 4112 or consent of department. Unified tensorial-theoretical treatment of the transport of mass, momentum, energy and voracity in fluids. General theorems for inviscid and irrotational flows. Fiscous effects, boundary layer theory, nonlinear phenomena hydrodynamic instability and turbulence with applications. (On Demand)

MEGR 7118. Thermal Environmental Engineering. (3) Prerequisite: MEGR 3116. Application of the thermodynamic and heat transfer principles to the analysis of thermal environmental systems. Topics include
MEGR 7129. Structural Dynamics of Production Machinery. (3) Prerequisite: Consent of the department. The analytical study of dynamic characteristics of production machinery and the corresponding measurement, specification, and effects on machine performance. Machine tool vibration, machine tool stability, high speed machining. (Spring)

MEGR 7128. Control of Robotic Manipulators. (3) Prerequisite: MECR 4127 or ECEG 4151. Control of industrial robots including linear, nonlinear, and adaptive control of the motion of robots; plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuators and sensors, robot vision and artificial intelligence, and control computer/robot interfacing (dual-listed with ECEG 5151). (Spring)

diffraction and spectroscopic analysis of matter. (Alternate Years)

MEGR 7165. Diffraction and NDE Methods in Materials Science. (3) Prerequisites: MEGR 3161 or equivalent or consent of the department. Principles of diffraction and non-destructive evaluation methods and their applications to material problems; characterization of atomic and microstructural features and process induced defects in materials; evaluation of residual stress and texture effects; phase and elemental analysis; experimental methodologies. (On Demand)

MEGR 7166. Deformation and Fracture of Materials. (3) Prerequisite: Consent of instructor. Macroscopic and microscopic aspects of elastic and plastic deformation and fracture; applications of dislocation theory to an interpretation and control of mechanical properties; temperature, strain rate and texture effects. (On Demand)

MEGR 7167. Mechanical Behavior of Materials II. (3) Prerequisite: MEGR 6166 or equivalent. Continuation of MEGR 6166; selection of topics to include further treatments of dislocation theory and its applications; analysis of fatigue and creep phenomena; strength of polymers and composites; statistical treatment of strength; materials design and failure analysis. (Spring)

MEGR 7172. Computational Methods in Engineering. (3) Prerequisite: MATH 6171 or consent of the department. Numerical linear algebra, solution of systems of equations, numerical integration, differentiation and interpolation, root finding, numerical solution of partial differential equations by finite difference and finite element methods. (On Demand)

MEGR 7182. Machine Tool Metrology. (3) Prerequisites: MEGR 2180, MEGR 3281, and MEGR 6181. Machine tool accuracy and performance testing. Modeling and measurement of volumetric accuracy using parametric error separation and quasi-static error models. Use of homogeneous transformations for error mapping. Linear and higher order thermal models. Error budgeting and management. Axis of rotation metrology, spindle accuracy, and cutting performance tests. Laboratory experience on CNC machine tools using heterodyne laser interferometers, capacitance gages, and other computer assisted sensor systems for machine checking. (Spring)

MEGR 7183. Design of Precision Machines and Instrument I. (3) Prerequisites: MEGR 3221 and MEGR 7182. Basic patterns in the design of precision machines and instruments. Design process, error assessment and examples, materials, sensors, drives, and controls for precision machines. Machine frames, sliding and rolling element bearings, flexures, hydrostatic bearings. Design methodology, analysis of potential design, design case studies, and modeling of design alternatives. (Fall)

MEGR 7184. Design of Precision Machines and Instrument II. (3) Prerequisites: MEGR 7183. Application of principles, methodology, and analysis to specific design problems. Management of design. Class will design machine components, subsystems or whole instruments either individually or as members of design teams. Critical design reviews will be conducted. Designs will be quantitatively analyzed for conformance to design specifications and intent. (Spring)

MEGR 7281. Theory and Application of Computer-Aided Tolerancing. (3) Prerequisite: consent of the department. Theory of geometric tolerance representation, analysis, and synthesis. Applications of geometric tolerances for design function and efficient metrology. Laboratory experience with mechanical design and tolerance analysis software. Implementation projects for tolerance analysis and synthesis. (Fall, Alternate Years)


MEGR 7283. Advanced Coordinate Metrology. (3) Prerequisite: MEGR 6181 or consent of the department. Error compensation of coordinate measuring machines, algorithms and sampling methods used in data analysis. Probing systems, compensation of probing errors. Scanning coordinate measuring machines and their dynamic behavior. Performance testing of coordinate measuring machines. (Spring, Alternate Years)

MEGR 7284. Advanced Surface Metrology. (3) Prerequisite: MEGR 6181 or consent of the department. Constituents of surface texture, stylus, optical, atomic force microscope and other advanced methods of measuring surface texture. Two and three dimensional measurement of surfaces. Separation of form, waviness and roughness. Random process analysis techniques, use of transforms for filtering. Numerical evaluation of surface texture. Use of surface texture as fingerprint of the process. Relationship between function and surface texture. (Spring, Alternate Years)

MEGR 7380. Tribology. (3) Prerequisite: consent of the department. Surface properties and study of surfaces in contact. Friction and wear of materials. Tribological properties of solid materials. Fluid lubricated journal bearings, lubrication of highly loaded contacts, lubricating systems and bearing selection. (On Demand)

MEGR 7480. Advanced Manufacturing Processes and Equipment. (3) Prerequisite: consent of the department. Detailed analytical treatment of
manufacturing materials and processes. Forming processes (forging, extrusion, rolling, drawing, bending, shearing), casting processes, metal cutting processes (turning, boring, drilling, shaping, milling), tool materials, joining processes, automation. (On Demand)

MEGR 7892. Individual Study and Projects. (1-6) Individual investigation and exposition of results. May be repeated for credit. (On Demand)

MEGR 7893. Advanced Topics in Precision Engineering. (3) Prerequisite: consent of the department. Selected topics in precision control, materials for precision engineering, precision manufacturing, precision measurement, advanced analytical and numerical methods used in precision engineering (may be repeated as the topics vary and with the approval of the department). (On Demand)

MEGR 7991. Graduate Master Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit (Fall, Spring)

MEGR 7999. Graduate Residence. (1) Required of all master's students not enrolled in other graduate courses who are working on or defending thesis/projects and/or are scheduled for comprehensive examinations. (Fall/Spring)

8000 level courses are for Ph.D. students only
MEGR 8090. Special Topics. (1-6) Directed study of current topics of special interest for Ph.D. degree. May be repeated for credit (On Demand)

MEGR 8101. Transport Processes. (3) See MEGR 7101 for Course Description.

MEGR 8102. Intro to Continua. (3) See MEGR 7102 for Course Description.

MEGR 8108. Finite Element Analysis and Applications. (3) See MEGR 7108 for Course Description.

MEGR 8110. Advanced Conductive Heat Transfer. (3) See MEGR 7110 for Course Description.

MEGR 8111. Advanced Engineering Thermodynamics. (3) See MEGR 7111 for Course Description.

MEGR 8112. Radiative Heat Transfer. (3) See MEGR 7112 for Course Description.

MEGR 8113. Dynamics and Thermodynamics of Compressible Flow. (3) See MEGR 7113 for Course Description.

MEGR 8114. Advanced Fluid Mechanics. (3) See MEGR 7114 for Course Description.

MEGR 8115. Convective Heat Transfer. (3) See MEGR 7115 for Course Description.


MEGR 8118. Thermal Environmental Engineering. (3) See MEGR 7118 for Course Description.

MEGR 8119. Thermal Applications in Biomedical Engineering. (3) See MEGR 7119 for Course Description.

MEGR 8120. Bearing Design and Lubrication. (3) See MEGR 7120 for Course Description.

MEGR 8121. Mechanism Analysis. (3) See MEGR 7121 for Course Description.

MEGR 8122. Mechanism Synthesis. (3) See MEGR 7122 for Course Description.

MEGR 8123. Mechanical Design. (3) See MEGR 7123 for Course Description.

MEGR 8124. Introduction to Automatic Controls. (3) See MEGR 7124 for Course Description.

MEGR 8125. Vibrations of Continuous Systems. (3) See MEGR 6125 for Course Description.

MEGR 8126. Dynamics of Machinery. (3) See MEGR 7126 for Course Description.

MEGR 8127. Computer-Aided Manufacturing. (3) See MEGR 7127 for Course Description.

MEGR 8128. Control of Robotic Manipulators. (3) See MEGR 7128 for Course Description.

MEGR 8129. Structural Dynamics of Production Machinery. (3) See MEGR 7129 for Course Description.

MEGR 8141. Theory of Elasticity I. (3) See MEGR 6141 for Course Description.

MEGR 8142. Theory of Elasticity II. (3) See MEGR 7142 for Course Description.

MEGR 8143. Inelastic Behavior of Materials. (3) See MEGR 7143 for Course Description.

MEGR 8145. Advanced Topics in Dynamics. (3) See MEGR 7145 for Course Description.
MEGR 8146. Experimental Stress Analysis. (3) See MEGR 7146 for Course Description.

MEGR 8161. Atomic Processes in Solids. (3) See MEGR 7161 for Course Description.

MEGR 8164. Diffraction/Spectroscopic Studies of Matter. (3) See MEGR 7164 for Course Description.

MEGR 8165. Diffraction and NDE Methods in Materials Science. (3) See MEGR 7165 for Course Description.

MEGR 8166. Mechanical Behavior of Materials I. (3) See MEGR 6166 for Course Description.

MEGR 8167. Mechanical Behavior of Materials II. (3) See MEGR 7167 for Course Description.

MEGR 8168. Deformation and Fracture of Materials. (3) See MEGR 7166 for Course Description.

MEGR 8172. Computational Methods in Engineering. (3) See MEGR 7172 for Course Description.

MEGR 8182. Machine Tool Metrology. (3) See MEGR 7182 for Course Description.

MEGR 8183. Design of Precision Machines and Instrument I. (3) See MEGR 7183 for Course Description.

MEGR 8184. Design of Precision Machines and Instrument II. (3) See MEGR 7184 for Course Description.

MEGR 8281. Theory and Application of Computer-Aided Tolerancing. (3) See MEGR 7281 for Course Description.

MEGR 8282. Computer-Aided Process Planning. (3) See MEGR 7282 for Course Description.

MEGR 8283. Advanced Coordinate Metrology. (3) See MEGR 7283 for Course Description.

MEGR 8284. Advanced Surface Metrology. (3) See MEGR 7284 for Course Description.

MEGR 8380. Tribology. (3) See MEGR 7380 for Course Description.

MEGR 8480. Advanced Manufacturing Processes and Equipment. (3) See MEGR 7480 for Course Description.

MEGR 8892. Individual Study and Projects. (1-6) See MEGR 7892 for Course Description.

MEGR 8893. Advanced Topics in Precision Engineering. (3) See MEGR 7893 for Course Description.


MEGR 9999. Doctoral Residence. (1)
In the newly transformed College of Health and Human Services at the University of North Carolina at Charlotte, students and faculty help chart the course for health care throughout the region. With excellence in educational programs, research, community service, continuing education and clinical practice, the college plays an important role in developing and implementing high quality health care practices. As an interdisciplinary college, many opportunities for collaborative teaching and research by students and faculty are available. Within the college’s educational programming, faculty and student research is a key component to successful learning outcomes. Additionally, the college incorporates information technology standards in all courses and offers online learning opportunities in many graduate programs.

**Graduate Degree Programs**
- Master of Health Administration
- Master of Science in Health Promotion
- Master of Science in Nursing: Adult Nurse Practitioner/Clinical Nurse Specialist
- Master of Science in Nursing: Adult Psychiatric Mental Health Nursing
- Master of Science in Nursing: Community Health Nursing
- Master of Science in Nursing: Family Nurse Practitioner
- Master of Science in Nursing: Nurse Anesthesia
- Master of Science in Nursing and Master of Health Administration
- Master of Social Work

**Graduate Non-Degree Programs**
- Certificate in Clinical Exercise Physiology
- Certificate in Community Health
- Certificate in Nurse Anesthesia (Post-Graduate Certificate)
- Certificate in Worksite Health Promotion

**Director**
Dr. Lutchmie Narine

**Graduate Faculty**
- William Brandon, Distinguished Professor
- Sonya Hardin, Assistant Professor
- Lutchmie Narine, Program Director and Associate Professor
- Gerald Pyle, Professor
- Linda Swayne, Professor
- Rosemarie Tong, Distinguished Professor
- Jennifer Troyer, Assistant Professor

**Program of Study**
The Master of Health Administration prepares administrators to function in a variety of health related institutions. Structured to meet the professional standards of the Accrediting Commission on Education for Health Services Administration (ACEHSA), the program is designed to address the needs of current health care managers, clinical professionals who anticipate future administrative responsibilities and pre-professionals who wish to prepare for an entry level career in health care administration.

The Master of Health Administration is a 45 hour degree program divided into required foundation, functional and capstone courses and elective courses. Administratively located within the Department of Health Behavior and Administration, it is an interdisciplinary program with courses taught by faculty from the College of Arts and Sciences, the Belk College of Business Administration and the College of Health and Human Services.

Students may enroll in the Master of Health Administration program on a full-time or part-time basis. Classes are scheduled in the evenings, and on weekends at both the UNC Charlotte main campus and at UNC Charlotte Uptown.

**Additional Admission Requirements**
To be considered for admission to graduate study in Health Administration, a student must present the following requirements in addition to those required by the Graduate School.

1) Overall grade point average of 3.0 on all previous post-secondary course work.
2) Acceptable scores on the verbal and quantitative portions of the Graduate Record Exam, the Graduate Management Admission Test or the Miller Analogies Test.
3) An essay describing the applicant’s experience and objective in undertaking graduate study.
4) Three evaluations from persons familiar with the applicant’s personal or professional qualifications.
5) There are corequisites for several courses within the curriculum. These corequisites do not need to be completed before submitting an application for admission.

6) Basic computer skills including word processing and use of spreadsheets.

Applicants with records of high quality professional experience who do not fulfill these formal requirements should discuss with the Director of the Health Administration Program other factors that may have a bearing on admission.

Courses
Each student is required to complete 36 hours (12 courses including the Internship) in the core curriculum. These courses offer a basic body of knowledge, skills and values relevant to health services administration. These courses are divided into three areas: foundation courses, functional courses and a capstone. While students may take courses within an area in any order, each area provides a knowledge base for subsequent courses. It is advisable to finish all courses within an area and proceed sequentially to the next grouping of courses. Additionally, students will select 9 credit hours (3 graduate courses) in elective studies. A student may choose to use two elective courses to complete a thesis. Students are encouraged to select courses that meet individual professional needs. Electives are available in several areas, including management specialties, gerontology, community health and non-profit organization.

Internships
Each student in the program is required to demonstrate professional experience in the health care delivery system. This requirement may be demonstrated through 1) a full-time administrative position in a health care delivery setting, or 2) an approved internship in a health care delivery administrative setting. Students who have no professional experience in a health care setting are required to undertake an internship experience. Each student must complete an MHA Internship Information form, describing professional experience or internship preference, and submit it to the MHA office. Students who elect an internship may register for HADM 6800 (Independent Study) on a pass/fail basis.

Prerequisite Requirements
Undergraduate courses in accounting and statistics.

Degree Requirements

Core Courses (33 hours)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HADM 6103</td>
<td>Health and Disease (3)</td>
</tr>
<tr>
<td>HADM 6112</td>
<td>Introduction to US Health Care Systems (3)</td>
</tr>
<tr>
<td>HADM 6114</td>
<td>Economics of Health Policy (3)</td>
</tr>
<tr>
<td>HADM 6123</td>
<td>Accounting for Health Care Management (3)</td>
</tr>
</tbody>
</table>

Functional Courses

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HADM 6125</td>
<td>Finances in Health Care Administration (3)</td>
</tr>
<tr>
<td>HADM 6141</td>
<td>Research Methods for Health Care Administration (3)</td>
</tr>
<tr>
<td>HADM 6145</td>
<td>Organization Theory for Health Systems (3)</td>
</tr>
<tr>
<td>HADM 6147</td>
<td>Human Resource Management (3)</td>
</tr>
<tr>
<td>HADM 6152</td>
<td>Information Resource Management (3)</td>
</tr>
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</table>

Capstone Course

HADM 6166, Strategic Management of Health Services Organizations (3), is the capstone course in the curriculum and incorporates the comprehensive examination.

Internship: (3)

Electives
Students will enroll in the internship and three electives or four elective courses. Students are encouraged to select courses that will complement their professional interest and educational goals. Elective courses are offered each semester by the Health Administration program or may be selected from other graduate programs to meet particular student interest.

Comprehensive Examination
Each student must successfully complete a comprehensive examination designed to test the knowledge and skills presented within the core curriculum. This examination is administered as part of a final presentation in the capstone course.

Thesis
Students may elect a two-course thesis sequence to produce and defend independent research relevant to health services administration that demonstrates a contribution to professional knowledge through systematic investigation. This course requires permission of the graduate faculty member who would direct the study as well as permission of the MHA coordinator prior to registration.

MHA/MSN Dual Degree
The Graduate Nursing Program and the Health Administration Program offer an integrated curriculum leading to a dual degree, both the MHA and the MSN. Applicants must hold a B.S.N. degree and must be admitted to both programs. The program is described in detail under graduate nursing programs.

COURSES IN HEALTH ADMINISTRATION

HADM 6000. Topics in Health Administration. (3)
Intensive study of a topic in health administration. The topic of investigation may vary from semester to semester. May be repeated for credit. (On demand)
HADM 6103. Health and Disease. (3) Prerequisite: undergraduate statistics course. Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease prevention. (Spring or Fall) (Evenings or Weekends)

HADM 6112 Introduction to the US Health Care System. (3) Overview of health care delivery in the United States including organizational structures, financing mechanisms and delivery systems, with particular attention to program formation. (Spring or Fall) (Evenings or Weekends)

HADM 6114. Economics of Health Policy. (3) Examination of the economic context of health care policy and application of economic concepts to the health care sector including supply and demand, elasticity, regulation, competition and cost effectiveness analysis. (Spring or Fall) (Evenings or Weekends)

HADM 6123. Accounting for Health Care Management. (3) Basic concepts and techniques of collecting, processing and reporting financial information relevant to health care institutions. Emphasizes a conceptual understanding of financial accounting, technical tools of cost accounting, including budget preparation and analysis, and interpretation of financial statements. (Prerequisite: undergraduate accounting course) (Spring or Fall) (Evenings or Weekends)

HADM 6125. Finance in Health Care Administration. (3) Prerequisite: HADM 6123. Fundamental financial management concepts and tools for health care institutions, including financial statements and attributes, capital acquisition and allocation, investment analysis, capital and cash flow management and contractual relationships. (Spring or Fall) (Evenings or Weekends)

HADM 6127. Health Policy Development. (3) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. (Same as MPAD 6176) (On Demand)

HADM 6130. Health Policy Development. (3) Analysis of ethical and bioethical problems confronting health care delivery systems. Selected legal principles and their application to the health care field, including corporate liability, malpractice, informed consent and governmental regulation of health personnel and health facilities. (Spring or Fall) (Evenings or Weekends)

HADM 6133. Trends and Issues in Health Administration. (3) Examination of current issues confronting health care managers and an assessment of programs and management responses to emerging trends in the health care field, including delivery systems, marketing/competition, financing and/or epidemiological changes. (Same as MPAD 6176) (On demand)

HADM 6135. Managed Care Systems. (3) Fundamentals of managed care systems, including risk arrangements, compensation, incentives, quality assurance, financing and public programs. (On demand)

HADM 6141. Research Methods for Health Care Administration. (3) Prerequisite: undergraduate statistics course. Study of selected statistical techniques useful in the analysis of managerial decisions and interpretation and evaluation of research. Introduction to systems analysis and selected operations research techniques as applied to problem solving and decision making in health care institutions. (Spring or Fall) (Evenings or Weekends)

HADM 6145. Organization Theory and Health Care Management. (3) Introduction to organizational theory with applications to health care systems, including organizational design and interorganizational networks/alliances. Examination of communication and leadership skills development, including conflict, labor and dispute management. (Spring or Fall) (Evenings or Weekends)

HADM 6147. Human Resources Management. (3) Examines human resources management as it applies to health services institutions, including compensation benefits, personnel planning, recruitment, selection, training and development, employee appraisal and discipline, union-management relations and quality management. (Spring or Fall) (Evenings or Weekends)

HADM 6152. Information Resources Management. (3) A study of the use of information management to improve the delivery of health care. Information resource management includes methods and practices to acquire, disseminate, store, interpret and use information to provide health care in a more efficient, effective and economical manner. Emphasis is placed upon information as central to the ongoing operations and strategic decisions of health care organizations. (Same as NURS 6162) (Spring or Fall) (Evenings or Weekends)

HADM 6166. Strategic Management of Health Services Organizations. (3) Prerequisites: All core courses except HADM 6130 and HADM 6152. Analysis of strategic planning, managing and marketing concepts, techniques and tools within the health care industry, including organizational capability analysis, competitor and environmental analysis and business plan development. (Spring or Fall) (Evenings or Weekends)

HADM 6800. Independent Study. (1-3) Guided individual study in an issue related to health administration arranged with a faculty member or supervised experience in an administrative setting in a
program or entity within the health care delivery system. 
(Pass/Fail) (On demand)

HADM 6999. Thesis. (3) Production of independent research relevant to health administration which demonstrates contribution to professional knowledge through systemic investigation. Pass/In Progress grading.

HADM 7999. Graduate Residence. (1) Prerequisite 6999. Continuation of thesis on a topic of significance in health administration.

HEALTH PROMOTION

Department of Health Behavior and Administration
Colvard North Building
704-687-4687
http://www.uncc.edu/colleges/health

Department of Kinesiology
Belk Gym
704-687-4695
http://www.uncc.edu/colleges/health

Degree
M.S., Certificates

Coordinator
Contact program

Graduate Faculty
Linda Berne, Professor
Rita Debate, Assistant Professor
Andrew Harver, Professor
J. Timothy Lightfoot, Professor
William J. McAuley, Professor
Gerald Pyle, Professor
Michael Turner, Assistant Professor

MASTER OF SCIENCE

Program of Study
The Master of Science in Health Promotion enables students to become health promotion specialists by fulfilling the basic requirements of the MS along with specialty courses to match students' interests. The series of core courses and selection of a specialty (clinical exercise physiology, community health promotion, or worksite health promotion) provide experiences useful for employment in a variety of settings such as health related agencies and organizations, hospitals, health departments, worksite wellness programs, fitness centers and/or insurance companies. The program in Health Promotion will be undergoing revision in 2002-2003.

Additional Admissions Requirements
1) Acceptable scores on the Miller Analogies Test or GRE.
2) Undergraduate GPA that demonstrates potential for successful graduate work
3) Undergraduate statistics course and a health-related course is required for all students. An anatomy and physiology course is required for students pursuing the clinical exercise physiology specialty. Individual specialty areas may have additional pre-requisites.

Degree Requirements
The program requires a minimum of 42 semester hours of graduate credit including 18 hours of core courses, 9 hours from a chosen concentration (either practitioner or researcher), and 15 hours in a content specialty area (either Clinical Exercise Physiology, Community Health Promotion, or Worksite Health Promotion).

Assistantships
Positions as a research assistant or teaching assistant may be available. Grant funded assistantships may be available as well.

Internships
Students needing field experiences may elect an internship course which provides 100 or more hours in a field placement.

Advising
Upon acceptance into the program, an academic advisor is assigned to each student. Students are expected to meet with their advisors on a regular basis to plan their progression through their program of study. Any course substitution must be cleared through the academic advisor.

Capstone Experiences
Near the completion of the program of study, each student is required to select either a health promotion project or research thesis. The student is responsible for organizing a committee of three faculty members (and an outside community person if appropriate) to supervise, monitor and evaluate the project or thesis.

Tuition Waivers
Tuition waivers are available with some grant-funded assistantships.

Program Certifications/Accreditations
Completion of the clinical exercise physiology specialty qualifies the graduate to take the Clinical Exercise Physiology Registry Examination (RCEP) administered by the American College of Sports Medicine.
Upon completion of the degree in health promotion, graduates are eligible to sit for the Certified Health Education Specialist (CHES) national certification examination administered by the National Commission for Health Education Credentialing.

Core Courses

HPKD 5299 Epidemiology (3)  
HPKD 6120 Philosophy and Practice of Health Promotion (3)  
HPKD 6141 Health Promotion Administration (3)  
HPKD 6143 Behavior Change in Health Promotion (3)  
HPKD 6222 Health Promotion Analysis (3)  
NURS 6160 Research Methods in Nursing and Health Professions (3)

CERTIFICATES

Graduate Certificate in Clinical Exercise Physiology
The Graduate Certificate Program in Clinical Exercise Physiology meets the rising demand for health care professionals that are qualified to test and prescribe appropriate exercise programs for clinical and non-clinical populations. The program would allow individuals with appropriate undergraduate or graduate degrees to receive further training that would enable them to sit for the Registered Clinical Exercise Physiologist national exam.

Admission Requirements
Students are admitted to the Graduate School in a special category for certificate programs. See general information on admission to graduate certificate programs elsewhere in this Catalog.

Certificate Requirements
The Graduate Certificate Program in Clinical Exercise Physiology requires 15 hours in the following approved courses: HPKD 5122 (Drugs and Society), HPKD 5126 (Adolescent Sexuality and Family Life Education), HPKD 5128 (Environmental Health: A Global Perspective), HPKD 6160 (Community Health), and HPKD 6279 (International Health).

Transfer credits are not accepted in the Certificate program.

Graduate Certificate in Community Health Promotion
The Graduate Certificate Program in Community Health Promotion contributes to the preparation of a range of community and public health practitioners to sit for the Certified Health Education Specialist (CHES) national exam.

Admission Requirements
Students are admitted to the Graduate School in a special category for certificate programs. See general information on admission to graduate certificate programs elsewhere in this Catalog.

Certificate Requirements
The Graduate Certificate Program in Community Health Promotion requires 15 hours in the following approved courses: HPKD 5120 (Mental and Emotional Well-Being), HPKD 5130 (Applied Nutrition for Today's Consumer), HPKD 5134 (Assessment and Development of Physical Fitness), HPKD 5232 (Physiology of Human Aging), and HPKD 6153 (Worksite and Health Promotion).

Transfer credits are not accepted in the Certificate program.

Graduate Certificate in Worksite Health Promotion
The Graduate Certificate Program in Worksite Health Promotion prepares professionals to meet the need for comprehensive employee health promotion programs at the workplace. The program prepares individuals to develop, implement, and evaluate workplace health programs.

Admission Requirements
Students are admitted to the Graduate School in a special category for certificate programs. See general information on admission to graduate certificate programs elsewhere in this Catalog.

Certificate Requirements
The Graduate Certificate Program in Worksite Health Promotion requires 15 hours in the following approved courses: HPKD 5120 (Mental and Emotional Well-Being), HPKD 5130 (Applied Nutrition for Today's Consumer), HPKD 5134 (Assessment and Development of Physical Fitness), HPKD 5232 (Physiology of Human Aging), and HPKD 6153 (Worksite and Health Promotion).

Transfer credits are not accepted in the Certificate program.

COURSES IN HEALTH PROMOTION

HPKD 5120. Mental and Emotional Well-being. (3)
Examines mental and emotional health from the perspective of the health educator's role as facilitator of mental and emotional wellness (2 year cycle)

HPKD 5122. Drugs and Society. (3) Teaching methodology, knowledge and skills for affecting appropriate behaviors through the study of use, misuse and abuse of natural and synthetic chemicals in today's society (On demand)
HPKD 5124. Safety Through the Life Span. (3)
Prerequisite: Consent of the department. Introduction to accident/injury prevention emphasizing personal responsibility for health care with a focus on psycho-social development and a wellness approach to safety management (On demand)

HPKD 5126. Adolescent Sexuality and Family Life Education. (3) Designed for teachers, counselors, school nurses, administrators and others responsible for family life education programs in school, with focus on adolescent sexuality issues. (2 year cycle Summer)

HPKD 5128. Environmental Health: A Global Perspective. (3) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through study of the causes and effects of contemporary environmental problems. (On demand)

HPKD 5130. Applied Nutrition for Today’s Consumer. (3) Principles of nutrition, dietary guidelines, dietary relationships to diseases and health, special populations, computerized dietary analysis. (2 year cycle)

HPKD 5134. Assessment and Development of Physical Fitness. (3) Prerequisite: consent of the instructor. Study of responses and adaptations to exercise, assessment techniques, exercise prescription, leadership and programming. (2 year cycle)

HPKD 5136. Health Product and Service Consumerism. (3) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through emphasis on the individual consumer at the health marketplace (On demand)

HPKD 5232. Physiology of Human Aging. (3) This course focuses on the normal physiological alterations that occur as the human progresses from a young adult to the latter stages of life. Special attention is given to interventions commonly promoted to combat the physiological changes that result from aging. (Every 2 years)

HPKD 5292. Clinical Athletic Training. (3) Advanced study of the clinical applications of common therapeutic modalities and rehabilitation in the treatment of athletic related injuries. (Every 2 years)

HPKD 5299. Epidemiology. (3) Prerequisite: permission of the instructor. Traditional aspects of epidemiology, including practical disease concepts, epidemiological measures of health status, mortality and morbidity rates and ratios, descriptive statistics, research design, cohort studies, case-control studies, and prospective and retrospective analysis. (Fall)

HPKD 6120. Philosophy and Practice in Health Promotion. (3) Philosophies, modalities and arenas of practice in health promotion; role delineation, professional development, advocacy and ethics. (Fall)

HPKD 6141. Health Promotion Administration. (3) Management and leadership, strategic planning, grant proposal

HPKD 6143. Behavior Change in Health Promotion. (3) Assessment and modification of health behaviors. (Spring)

HPKD 6145. Health Promotion Planning and Evaluation. (3) Designing, implementing and evaluating health promotion/education programs within work site, school and community settings. (Fall)

HPKD 6151. Coordinating the School Health Education Program. (3) Examines the school health education program from the perspective of the school health education coordinator. (On demand)

HPKD 6153. Worksite Health Promotion. (3) Prerequisite: consent of the instructor. An exploration of the practices of promoting health in various setting for a variety of consumers. (Yearly)

HPKD 6155. Health Risk Reduction and Disease Prevention. (3) Personal/professional management of risk factors and lifestyle intervention processes for leading causes of mortality and morbidity. (On demand)

HPKD 6160. Community Health. (3) The nature and delineation of communities as social systems; principles and practices relevant to community health. (Yearly)

HPKD 6189. Community Epidemiology. (3) Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease preventions. (Same as HADM 6103) (Spring)

HPKD 6222. Health Promotion Analysis. (3) The purpose of this course is to teach students data analysis techniques used in health professions. Students will understand data in terms of proper analysis techniques, perform various types of data analyses using various software applications, interpret results, and communicate results orally and in writing. (Spring)

HPKD 6223. Advanced Data Analysis in Health Promotion. (3) Prerequisite: HPKD 6222. The purpose of this course is to educate students on advanced statistical and data analysis techniques used in health professions. Additionally, this course is designed to increase students’ ability to use health related computer software. (Every 2 years)

HPKD 6224. Health Promotion Measurement. (3) Prerequisite: FIPKD 6222: The purpose of this course is to educate students on applied measurement techniques used in the health sciences. The skills obtained from this
course will be useful in health related program evaluations, testing of models of health theories, development of health surveys, health needs assessments. It includes an exploration of methods of establishing reliability and validity estimates as modeled by Classical Test Theory, Item Response Theory, and through the use of Structural Equation Modeling with Health Theories. (Every 2 years)

HPKD 6250. Methods in Health Promotion and Education. (3) Core requisite: HPKD 6120, HPKD 6143, or permission of instructor. Instructional pedagogy and health promotion methods based on the ecological model of health including strategies directed at policy, community, institutional, inter-and intra-personal levels. (Fall)

HPKD 6279. International Health. (3) Principles and methods of studying international health, including historical background, sources and problems associated with health data, the social context, the role of government and non-government agencies, health in relation to environment and development, international health projects, defining the international health sector, infectious disease problems, and the practice of international health. (Every 2 years)

HPKD 6280. Advanced Exercise Physiology. (3) Prerequisite: HPKD 2280 or similar coursework. Advanced study of the functioning of physiological systems during exercise with emphasis on current literature and research. (Every 2 years)

HPKD 6471. Seminar and Internship in Health Education. (1-6) Prerequisites: Completion of 12 or more graduate credit hours in health education and permission of the health promotion program coordinator. Supervised practice in health education. May be repeated for a different seminar and internship. Offered only on a Pass/No Credit basis. (Fall, Spring, Summer)

HPKD 6899. Problems and Topics in Health. (1-6) Topics and special problems related to issues, practices or sufficient trends in health promotion. Institutes, workshops, seminars and independent studies. (Fall, Spring, Summer)

HPKD 6886. Health Promotion Project. (3) Prerequisite: completion of 36 hours toward the Health Promotion Master of Science Degree. A capstone synthesis course in which candidate applies needs assessments, program planning, implementing, and evaluation skills to a problem or an opportunity in a community health promotion setting with a target population. (Every semester)

HPKD 6900. Research and Thesis in Health Promotion. (3) Prerequisite: Satisfactory completion of NURS 6160; completion of at least 24 hours of graduate program; consent of instructor overseeing thesis research. Design, implementation, presentation, and evaluation of an approved research project in student's specialty area. The applied project is of the student's own design under the supervision of an advisor and graduate committee. Graded Pass/No Credit only. (Every semester)

HPKD 7999. Graduate Residence. (1) Independent research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. (Fall, Spring)

NURSING

School of Nursing
2038 Colvard Building
http://www.uncc.edu/colleges/health/

The graduate nursing program is offered by the School of Nursing. The six specialty concentrations available include: Adult Nurse Practitioner/Clinical Nurse Specialist, Adult Psychiatric/Mental Health Nursing, Community Health Nursing, Family Nurse Practitioner, Nurse Anesthesia and the MSN/MHA. Additionally, options in School Nursing are available in both the Family Nurse Practitioner and Community Health concentrations.

Department of Adult Health Nursing
2046 Colvard Building
704-687-4652

Department of Family and Community Nursing
2038 Colvard Building
704-687-4683

Coordinators

Adult Nurse Practitioner/Clinical Nurse Specialist
Linda Steele, Assistant Professor

Community Health Nursing
David Langford, Associate Professor

Family Nurse Practitioner
Linda Steele, Assistant Professor

Psychiatric/Mental Health
Ann Newman, Associate Professor

Nurse Anesthesia
Leslie Hussey, Associate Professor

MSN/MHA
Sonya Hardin, Assistant Professor
Program Name
Master of Science in Nursing

Degree
MSN, MSN/MHA

The CCNE accredited Master of Science in Nursing degree is designed to prepare nurses for advanced practice in a specialized area of nursing as a clinical nurse specialist, nurse practitioner or nurse administrator. Six specialty concentrations are available:

- Advanced Practice Registered Nursing (Adult Nurse Practitioner/Clinical Nurse Specialist)
- Community Health Nursing (option in school nursing)
- Family Nurse Practitioner (option in school nursing)
- Psychiatric/Mental Health Nursing
- Nurse Anesthesia
- MSN/MHA: Dual degree program in Nursing and Health Administration

Additional Admission and Progression Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Nursing*:

1) Current unrestricted licensure as a Registered Nurse. Current licensure to practice nursing in North Carolina or the state identified by faculty for clinical practice is required for progression into clinical courses.

2) Baccalaureate degree from a nationally accredited nursing program.

3) Satisfactory performance on the aptitude portion of the Graduate Record Exam or the Miller Analogies Test.

4) One year of professional nursing practice following completion of the baccalaureate degree is recommended.

5) Overall GPA of at least 3.0 on the last 60 semester hours attempted.

6) Completion of a statistics course with a grade of C or better.

7) The application for admission and all supporting credentials must be received in the Office of Graduate Admissions no later than November 15 for spring admission, March 15 for summer admission and July 1 for fall admission.

*See additional requirements for each specialty concentration

Early Entry Program for the Master of Science in Nursing
A student makes application to the Graduate School in their first semester of the RN/BSN program. Students must obtain satisfactory scores on GREs or MATs as do other nursing graduate students, have an overall GPA of at least 3.2, at least 75 hours completed, and the usual letters of recommendation. Students must also have at least one year nursing practice if they have a B.S. or B.A. in another field or two years nursing practice if they come from a diploma or associate degree program. In addition, they must have at least 9 hours of work at a senior university. Students can be admitted to either of the following concentrations: Community Health, Adult Nurse Practitioner/Clinical Nurse Specialist or Psych/Mental Health Nursing. A student may submit an application after completion of at least 75 undergraduate hours. A student may not be admitted into the program until completion of at least 90 undergraduate hours.

Admission is conditional based upon evidence of successful completion of the BSN and maintenance of a GPA of at least 3.0 on the last 60 hours of nursing courses. On conditional admission to the MSN program, six graduate credit hours will be substituted for the six required undergraduate hours. NURS 6160 will be substituted for NURS 4900. NURS 6115 will be substituted for NURN 4251. The designated graduate courses are MSN courses required of all students in the MSN program regardless of the clinical specialty concentration.

Degree Requirements
The MSN specialty concentrations require completion of 42 to 63 graduate credit hours depending on the specialty. Specific requirements and prerequisites for each program are listed below. Most concentrations are designed to accommodate full-time and part-time students, and many classes are held in the evening.

Graduate transfer credit may be accepted from another accredited institution for up to six semester hours upon approval of the student's adviser, the department chair and the Dean of the Graduate School. All course work, including accepted transfer credits, must be completed within a six-year period.

Assistantships
A limited number of graduate assistantships are available. Information about them is available in each Department and the Office of the Associate Dean for Academic Affairs, College of Health and Human Services, 704-687-4651.

Additional Financial Aid
Scholarships from the North Carolina Nurse Scholars Program – Master’s Program (M-NSP) are available to part-time or full-time students admitted to the nursing program for up to two years of study. The M-NSP scholarships are competitive and preference will be given to full-time students. Awards are not based on financial need. The application deadline is early May. Further information and application forms are available in the Office of Student Services in the College of Health and Human Services.

A limited number of Professional Nurse Traineeships are available to full-time graduate nursing students admitted
to a clinical specialty concentration. The traineeship awards provide in-state tuition/fee and a small stipend. Further information and application forms are available from the Office of the Associate Dean for Academic Affairs, College of Health and Human Services, 704-687-4651.

ADVANCED PRACTICE
REGISTERED NURSING
IN ADULT CHRONIC
CARE

Adult Health Nursing
Colvard 2038
704-687-4652
http://www.uncc.edu/colleges/health/

Degree
M.S.N.

Coordinator
Linda Steele, Assistant Professor

Graduate Faculty
Mary Curran, Associate Professor
Sonya Hardin, Assistant Professor
Leslie Hussey, Associate Professor
Pamala Larsen, Associate Professor
Linda Moore, Associate Professor
Linda Steele, Assistant Professor
Shirley Travis, Professor
Margaret Wilmoth, Associate Professor

Advanced Practice Registered Nursing in Adult Chronic Care
The program of study will lead to a Master of Science in Nursing degree, with a concentration in Adult Health Nursing. These advanced practice registered nurses will be prepared to function as clinical nurse specialists and/or adult nurse practitioners in a blended role with a specialty in chronic illness care and will function in diverse settings. The graduates of the program will be advanced practice nurses with an expertise in chronic illness who will possess advanced clinical diagnostic and reasoning skills to manage and prescribe health care for adults with chronic illness, identify high risk behaviors that have the potential to lead to chronic illness, provide health promotion and disease prevention instruction and collaborate with patients and their families to manage care. The graduate will be eligible to take the American Nurses Credentialing Center (ANCC) examination for Adult Nurse Practitioners and the Medical-Surgical or Gerontological ANCC examination as a Clinical Nurse Specialist.

Degree Requirements
The program requires completion of 47 semester credit hours in approved courses including:

Core Courses (9 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6160 Research in Nursing and the Health Professions (3)
- NURS 6115 Health Policy and Planning in the U.S (3)

Cognate Courses (6 hours)
- BIOL 6050 Special Topics in Physiology (Pathophysiology) (3)
- RSCH 6110 Descriptive and Inferential Statistics in Education (3)

Advanced Practice Specialty (8 hours)
- NURS 6230 Advanced Health Assessment and Diagnostic Reasoning (3)
- NURS 6220 Pharmacotherapeutics in Advanced Nursing Practice (3)
- NURS 6105 Roles and Issues in Advanced Practice Registered Nursing (2)

Specialty Concentration (24 hours)
Specialty concentration courses emphasize advanced preparation in the specialized area of chronic illness nursing practice. The required courses include:
- NUCI 6100 Chronic Illness: Concepts and Theories for Advanced Nursing Practice (3)
- NUCI 6106 Health Care Management of Adults I (3)
- NUCI 6107 Health Care Management of Adults II (3)
- NUCI 6401 Advanced Practice Nursing in Ambulatory Care (4)
- NUCI 6402 Advanced Practice Nursing in Acute Care (4)
- NUCI 6403 Advanced Practice Nursing in Chronic Care (4)
- NUCI 6601 Synthesis in Advanced Practice Nursing of Chronically Ill Adults (3)

ADULT PSYCHIATRIC
MENTAL HEALTH
NURSING

Family & Community Nursing
Colvard 2038
704-687-4683
http://www.uncc.edu/colleges/health/

Degree
M.S.N.
Coordinator
Ann Newman, Associate Professor

Graduate Faculty
William Cody, Professor and Chair
Lienne Edwards, Associate Professor
David Langford, Associate Professor
Carolyn Maynard, Assistant Professor
Jane Neese, Associate Professor
Ann Newman, Associate Professor

The Adult Psychiatric Mental Health Clinical Nurse Specialist track focuses on the role of the advanced PMHN in the assessment and management of individuals, groups, and communities. Graduates of this program will be prepared to complete requirements for certification as a Certified Specialist in Adult Psychiatric and Mental Health Nursing.

Additional Admission Requirements
A Graduate Record Exam (GRE) (score of 500 on each of 2 of the 3 sections) or the Miller Analogy (MAT) (score of 40 or above) is required.
Rolling admissions: applicants may apply any time during the school year.

Prerequisite Requirements
1) Undergraduate statistics course with a grade of C or better;
2) Current encumbered licensure as an RN in North Carolina;
3) Bachelor of Science in Nursing (BSN) degree from a nationally accredited program with an overall GPA of at least 3.0 (on a 4.0 scale)
4) A GPA of at least 3.0 on the last 60 semester hours; and
5) Computer competency.

Degree Requirements
This program requires 43 semester hours as follows:

Core Courses (15 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and Health Professions (3)
- NURS 6210 Family Health in Advanced Practice Nursing (2)
- NURS 6105 Roles and Issues in Advanced Practice Registered Nursing (2)
- NUCN 6201 Community Theory and Assessment (1)
- NUCN 6401 Community Assessment Lab (1)

Specialty Concentration (22 hours)
- NURS 6220 Pharmacotherapeutics for Advanced Nursing Practice (3)
- NURS 6230 Advanced Health Assessment and Diagnostic Reasoning (2)
- NURS 6430 Advanced Health Assessment Practicum (1)
- NUMH 6200 Psychiatric Mental Health Theories and Constructs of Mental Health Care (3)
- NUMH 6130 Advanced Psychiatric Mental Health Nursing Practice with Individuals (2)
- NUMH 6430 Practicum in Advanced Practice Psychiatric Mental Health Nursing with Individuals (2)
- NUMH 6135 Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities (2)
- NUMH 6435 Practicum in Advanced Practice Psychiatric Mental Health Nursing with Groups and Communities (2)
- NUMH 6201 Seminars in Advanced Practice Psychiatric Mental Health Nursing (1)
- NUMH 6401 Internship in Advanced Psychiatric Mental Health Nursing Practice (4)

Cognate Courses (6 hours)
- BIOL 6050 Advanced Human Physiology (3)
- RSCH 6110 Inferential Statistics or Equivalent (3)

Internship
NUMH 6401 Internship in Advanced Psychiatric-Mental Health Nursing Practice (240 hours)

Practica
A total of 540 hours of supervised clinical practice experience is required to complete the program.

Advising
Faculty advising is required each semester.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

COMMUNITY HEALTH NURSING

Family & Community Nursing
Colvard 2038
704-687-4683
http://www.uncc.edu/colleges/health/

Degree
M.S.N.

Coordinator
David Langford, Associate Professor
The Community Health Nursing specialty prepares nurses to assess communities, identify high risk populations, and to work with those populations to develop culturally sensitive, acceptable and realistic community-based nursing services. By preparing nurses to develop such services, the program helps meet the health care needs of North Carolina residents who live in urban and rural areas. The School Nurse option within the Community Health Nursing track offers nurses the opportunity to assume leadership roles in schools and surrounding communities to plan and implement programs.

Additional Admission Requirements
Rolling admission - applicants may apply any time during the school year.

Prerequisite Requirements
1) Undergraduate statistics course with a grade of C or better.
2) One year of professional nursing practice following completion of the baccalaureate degree is recommended.
3) Bachelor of Science in Nursing (BSN) degree from a nationally accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) on the last 60 semester hours.
4) Computer competency
5) Graduate Record Exam (GRE) - score of 500 on each of 2 out of 3 sections or Miller Analogy Test (MAT) - score of 40 or above.

Degree Requirements
The concentration requires completion of 45 semester hours in approved courses.

Core Courses (15 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6105 Roles and Issues in Advanced Practice Registered Nursing (2)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and Health Professions (3)
- NUCN 6201 Community Theory and Assessment (1)
- NUCN 6401 Community Assessment Lab (1)
- NURS 6210 Family Health in Advanced Practice Nursing (2)

Specialty Concentration (15 hours population focus; 18 hours school nurse option)
- NUCN 6202 Advanced Nursing Care in the Community (3)
- NUCN 6203 Prevention and Diverse Populations (3) for population focus
- NUCN 6204 Synthesis in Community Health Nursing (2)
- NUCN 6404 Synthesis in Community Health Nursing Lab (1)
- NUCN 6207 Management of Child and Adolescent Health in Schools (3) for school nurse focus
- NURS 6230 Health Assessment & Diagnostic Reasoning for Adv. Nursing Practice (2) for school nurse option
- NURS 6430 Health Assessment Lab (1) for school nurse option
- NUCN 6405 Community Health/School Nursing Internship (3)
- NUCN 6406 Community Health/School Nursing Internship (3)

Cognates
Population Focus Option (12 hours)
- HADM 6130 Health Law and Ethics (3) for population focus
- HPKD 6189 Community Epidemiology (3) for population focus
- RSCH 6110 Inferential Statistics (3)
- 2 Required Guided Electives (6 hours)

School Nurse Option in Community Health (6 hours)
- BIOL 6050 Advanced Human Pathophysiology (3)
- Required Guided Elective (3 hours)

Internships
- NUCN 6405 Community Health Nursing Internship I (180 hours)
- NUCN 6406 Community Health Nursing Internship II (180 hours)

Practica
A total of 480 hours supervised community health nursing practice is required to complete the program. This includes two 1-credit clinical courses plus the internships.

Capstone Experiences
- NUCN 6204 Synthesis in Community Health Nursing (2)
- NUCN 6404 Synthesis in Community Health Nursing Lab (1)

Electives
Two required.

Advising
Faculty advising required each semester.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.
The Family Nurse Practitioner (FNP) program prepares advanced practice nurses to deliver primary care to families across the life span. The program underscores the needs of culturally diverse families in rural and medically underserved areas and equips students to provide comprehensive care in the following areas: prevention, health maintenance and health promotion. The School Nurse option within the Family Nurse Practitioner concentration offers nurses the opportunity to provide primary care to students and their families in schools, school-based clinics, or school-linked clinics and assume leadership roles in school health programs. Graduates of the program are eligible to take the national American Nurses Association or the American Academy of Nurse Practitioners credentialing examination for the family nurse practitioner. Graduates of the FNP program are eligible to apply to practice as nurse practitioners in the state(s) of their choice.

Additional Admission Requirements
Admission offered once per year in Fall. Applications must be received by March 15 for Fall admissions. Rolling admission (processed as received) for School Nurse Option. A statement of purpose is required that explains the applicant's career goal in relation to primary care and family practice.

Prerequisite Requirements
1) Undergraduate statistics course with a grade of C or better. 
2) Current encumbered licensure as an RN in North Carolina. 
3) One to two years recent clinical experience as an RN.
4) Bachelor of Science in Nursing (BSN) degree from a nationally accredited program with an overall GPA of 3.0 (on a 4.0 scale) on the last 60 semester hours.
5) Computer competency
6) Graduate Record Exam (GRE) - score of 500 on each of 2 out of 3 sections or Miller Analogy Test (MAT) - score of 40 or above

Degree Requirements
The FNP concentration requires completion of 49 semester hours. The FNP with the School Nurse Option requires completion of 55 semester hours.

Core Courses (15 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and the Health Professions (3)
- NUCN 6201 Community Theory and Assessment (1)
- NUCN 6401 Community Assessment Lab (1)
- NURS 6210 Family Health in Advanced Practice Nursing (2)
- NURS 6105 Roles and Issues in Advanced Practice Nursing (2)

Specialty Concentration (25 hours)
- NURS 6220 Pharmacotherapeutics in Advanced Nursing Practice (3)
- NURS 6230 Advanced Health Assessment and Diagnostic Reasoning (2)
- NURS 6430 Advanced Health Assessment Practicum (1)
- NUNP 6240 Advanced Primary Care of Women (3)
- NUNP 6440 Advanced Primary Care of Women Practicum (2)
- NUNP 6250 Advanced Primary Care of Adults (3)
- NUNP 6450 Advanced Primary Care of Adults Practicum (2)
- NUNP 6260 Advanced Primary Care of Children and Adolescents (3)
- NUNP 6460 Advanced Primary Care of Children and Adolescents Practicum (2)
- NUNP 6400 Internship in Family Health (4)

Cognate Courses (9 hours)
- BIOL 6050 Advanced Human Physiology (3)
- BIOL 6050 Advanced Human Pathophysiology (3)
- RSCH 6110 Inferential Statistics or Equivalent (3)

School Nurse Option
Requires the above courses with the following addition: NUCN 6202 Advanced Nursing Care in the Community (3)
One 3-credit elective from an approved list (3)

Internships
- NUNP 6400 Internship in Family Health Nursing (240 hours)
Practica
A total of 700 hours supervised clinical practice experience is required to complete the program.

Electives
None required for the traditional FNP major. School Nurse option within the FNP tract requires one approved elective (3 hours).

Advising
Faculty advising required each semester.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

NURSE ANESTHESIA

Adult Health Nursing
Colvard 2046
704-687-4652
http://www.uncc.edu/colleges/health/

Degree
M.S.N., Certificate

Coordinator
Leslie Hussey, Associate Professor

The specialty concentration in Nurse Anesthesia is offered in conjunction with the Carolinas Health Care System and is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs. It provides both the theory and clinical practice required to qualify to take the national certifying examination upon graduation. In addition to MSN core courses, students complete cognate and clinical courses in nurse anesthesia as well as a clinical experiences at Carolinas Health Care System and other affiliated sites.

Additional Admission Requirements
In addition to the requirements of the Graduate School and College, applicants to the Nurse Anesthesia program must have:
1) An overall 3.0 in all undergraduate work;
2) 18 months to 2 years of current critical care experience with adult clients;
3) Certification in Advanced Cardiac Life Support (ACLS), Basic Cardiac Life Support (BCLS) Pediatric Advanced Life Support (PALS); and
4) Satisfactory GRE scores (MAT scores are not accepted).

Applicants who meet the admission requirements will be eligible to be invited for an interview with the Admissions Committee. Only after a successful interview, will the applicant be admitted.

Degree Requirements
The program requires completion of 63 semester hours in approved courses including:

Core Courses (15 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and the Health Professions (3)
- RSCH 6110 Inferential Statistics or Equivalent (3)
- BIOL 6050 Advanced Human Physiology (3)

Clinical Concentration (48 hours)
- NUAN 6151 Principles of Nurse Anesthesia I (3)
- NUAN 6152 Principles of Nurse Anesthesia II (3)
- NUAN 6153 Principles of Nurse Anesthesia III (3)
- NUAN 6154 Pharmacology in Nurse Anesthesia I (4)
- NUAN 6155 Pharmacology in Nurse Anesthesia II (4)
- NUAN 6156 Applied Physics and Chemistry in Nurse Anesthesia (3)
- NUAN 6157 Applied Pathophysiology in Nurse Anesthesia I (3)
- NUAN 6158 Applied Pathophysiology in Nurse Anesthesia II (3)
- NUAN 6159 Professional Aspects of Nurse Anesthesia (2)
- NUAN 6485 Clinical Residency in Nurse Anesthesia I (5)
- NUAN 6486 Clinical Residency in Nurse Anesthesia II (5)
- NUAN 6487 Clinical Residency in Nurse Anesthesia III (5)
- NUAN 6489 Clinical Residency in Nurse Anesthesia IV (5)

CERTIFICATE
Post-Graduate Certificate in Nurse Anesthesia

The graduate certificate will be awarded to students who have completed a Master of Science in Nursing (MSN) from an accredited program and wish to function as a Certified Registered Nurse Anesthetist (CRNA).

Additional Admission Requirements
In addition to the requirements of the Graduate School and College, applicants to the Nurse Anesthesia program must have:
1) 18 months to 2 years of current critical care experience with adult clients;
2) Certification in Advanced Cardiac Life Support (ACLS), Basic Cardiac Life Support (BCLS) Pediatric Advanced Life Support (PALS); (4) satisfactory GRE scores (MAT scores are not accepted);
3) A Graduate level Physiology course (equivalent to BIOL 6050) within the last 3 years; and
4) Personal statement outlining why the applicant seeks admission to graduate certificate program

Applicants who meet the admission requirements will be eligible to be invited for an interview with the Admissions Committee. Only after a successful interview, will the applicant be admitted.

Certificate Requirements
The full-time course of study plan allow for certificate completion within 27 months. Courses must be taken in the order outlined in the master’s curriculum. In addition the student must complete all requirements outlined by the Council on Certification of Nurse Anesthetists (CCNA)

Clinical Concentration (48 hours)
- NUAN 6151 Principles of Anesthesia I (3)
- NUAN 6152 Principles of Anesthesia II (3)
- NUAN 6153 Principles of Anesthesia III (3)
- NUAN 6154 Pharmacology in Nurse Anesthesia I (4)
- NUAN 6155 Pharmacology in Nurse Anesthesia II (4)
- NUAN 6156 Applied Physics and Chemistry in Nurse Anesthesia (3)
- NUAN 6157 Applied Pathophysiology in Nurse Anesthesia I (3)
- NUAN 6158 Applied Pathophysiology in Nurse Anesthesia II (3)
- NUAN 6159 Professional Aspects of Nurse Anesthesia (2)
- NUAN 6485 Clinical Residency in Nurse Anesthesia I (5)
- NUAN 6486 Clinical Residency in Nurse Anesthesia II (5)
- NUAN 6487 Clinical Residency in Nurse Anesthesia III (5)
- NUAN 6489 Clinical Residency in Nurse Anesthesia IV (5)

NURSING AND HEALTH ADMINISTRATION

Adult Health Nursing
Colvard 2046
704-687-4652
http://www.uncc.edu/colleges/health/

Degree
M.S.N./M.H.A.

Coordinator
Sonya Hardin, Assistant Professor

Graduate Faculty

Nursing
Mary Curran, Associate Professor
Sonya Hardin, Assistant Professor
Leslie Huskin, Associate Professor
Pamala Larsen, Associate Professor
Linda Moore, Associate Professor
Shirley Travis, Dean W. Colvard Distinguished Professor
Linda Steele, Assistant Professor
Margaret Wilmoth, Associate Professor

Health Administration
William Brandon, Professor
Lutchmie Narine, Associate Professor
Gerald Pyle, Professor
Linda Swayne, Professor
Rosemarie Tong, Professor
Jennifer Troyer, Assistant Professor

The Master of Science in Nursing and Master of Health Administration program is an interdisciplinary dual degree program designed to prepare nurse executives. This program enables baccalaureate prepared nurses to pursue a degree option which combines the areas of nursing and health care administration. Applicants must be admitted to and satisfy requirements for both programs. Graduates of the program will be eligible to take the American Nurses Credentialing Center (ANCC) examination for Nurse Administration, Advanced.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in the MSN/MHA program:
1) BSN degree from a nationally accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) on all previous work beyond high school.
2) Current unencumbered licensure as a Registered Nurse in North Carolina.
3) Satisfactory performance on the Graduate Record Exam (GRE), Miller’s Analogies Test (MAT), or the Graduate Management Admission Test (GMAT). (Not required for applicants who hold another graduate degree; e.g. M.B.A., M.S.W., M.D.)
4) Prerequisite course in introductory statistics with a grade of C or better.
5) Essay describing the applicant’s experience and objective in undertaking graduate study.
6) Basic computer skills including the use of word processing, spread sheet and data base software.
7) A course in basic accounting is a prerequisite for Accounting for Health Care Management, but does not have to be completed before admission.

Degree Requirements
The MSN/MHA degree requires 51 credit hours. Additionally each student will complete a 144-hour practicum experience in nursing administration:
222 College of Health and Human Services

Required Courses for Nursing and Health Administration (30 hours)

- RSCH 6110 Inferential Statistics (3)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6160 Research in Nursing and the Health Professions (3)
- NURS 6162/HADM 6152 Information Resource Management (3)
- NUNA 6175 Theory & Application of Admin to Nursing Systems (3)
- NUNA 6490 Advanced Practicum in Nursing Administration (3)
- HPKD 6189 Community Epidemiology (3)
- NURS 6115 Health Policy and Planning in the U.S. (3) or HADM 6112 Introduction to the U.S. Health Care System (3)
- Guided Nursing Elective (3)

Required Courses for Health Administration (24 hours)

- HADM 6114 Economics of Health Policy (3)
- HADM 6123 Accounting for Health Care Management (3)
- HADM 6125 Finance in Health Care Administration (3)
- HADM 6130 Health Law and Ethics (3)
- HADM 6145 Organization Theory for Health Systems (3)
- HADM 6147 Human Resource Management (3)
- HADM 6166 Strategic Management of Health Services Organizations (3)
- Guided Elective (3)

Practicum/Capstone Experience

NUNA 6490 Advanced Practicum in Nursing Administration (3)

Advising

Faculty advising is required each semester.

Research Opportunities/Experiences

Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

COURSES IN NURSING

NUAN 6151. Principles of Nurse Anesthesia I. (3)
Prerequisite: NURS 6156. Overview of the principles, techniques and equipment necessary for the administration of anesthesia for the general surgical client. (Spring, Summer)

NUAN 6152. Principles of Anesthesia II. (3)
Prerequisite: NURS 6151. Specific techniques of nurse anesthesia practice for selected clients. (Summer)

NUAN 6153. Principles of Anesthesia III. (3)
Prerequisite: NURS 6152. Advanced nurse anesthesia practice for selected clients (Fall)

NUAN 6154. Pharmacology in Nurse Anesthesia I. (4) Prerequisite: Consent of the Department. Introduction to the pharmacology of anesthetic drugs and adjunctive agents, including general pharmacological principles, pharmacokinetics and pharmacodynamics. (Fall)

NUAN 6155. Pharmacology in Nurse Anesthesia II. (4) Prerequisite: NURS 6154. Continuation of Pharmacology I with emphasis on the clinical use of anesthetic agents and adjunctive drugs. (Spring)

NUAN 6156. Applied Physics and Chemistry in Nurse Anesthesia. (3) Prerequisite: Consent of the Department. Basic laws and principles of physics, inorganic chemistry and organic chemistry as they apply to the clinical practice of nurse anesthesia. (Fall)

NUAN 6157. Applied Pathophysiology in Nurse Anesthesia I. (3) Prerequisite: BIOL 6050. Pathophysiology of the nervous and cardiovascular systems with emphasis on their anesthetic implications. (Spring)

NUAN 6158. Applied Pathophysiology in Nurse Anesthesia II. (3) Prerequisite: NURS 6157. Pathophysiology of the respiratory, endocrine, excretory and renal systems with emphasis on their anesthetic implications (Summer)

NUAN 6159. Professional Aspects of Nurse Anesthesia. (1) Prerequisite: NUAN 6153. Overview of the legal aspects regarding the practice of nurse anesthesia and information about the American Association of Nurse Anesthetists, including its history and Councils on Accreditation, Licensure and Practice. (Spring)

NUAN 6485. Clinical Residency in Nurse Anesthesia I. (5) Prerequisite: NUAN 6153. Clinical application of didactic material from the nurse anesthesia curriculum through beginning level practice in the role of a nurse anesthetist. Conferences during the clinical residency provide opportunities to review current research and practice issues. Pass/Unsatisfactory grading only. (Fall, Spring)

NUAN 6486. Clinical Residency in Nurse Anesthesia II. (5) Prerequisite: NUAN 6485. Continuation of the clinical application of didactic material from the nurse anesthesia curriculum with focus on utilization of additional anesthesia techniques and increased skills development. Pass/Unsatisfactory grading only. (Spring, Summer)

NUAN 6487. Clinical Residency in Nurse Anesthesia III. (5) Prerequisite: NUAN 6486. Incorporation of the
content of the nurse anesthesia curriculum with opportunities to begin synthesis of all didactic material and techniques for efficient clinical practice. (Fall, Summer)

NUAN 6489. Clinical Residency in Nurse Anesthesia
IV. (5) Prerequisite: NUAN 6487. Non-credit clinical residency for synthesis of all didactic material and techniques of nurse anesthesia clinical practice, promotion of professional practice, and preparation of the student for the licensure examination. (Fall, Spring)

NUCI 6100. Chronic Illness Concepts and Theories for Advanced Nursing Practice. (3) Prerequisite: or Corequisite: NURS 6101 or 6160. Focus on contemporary chronic illness concepts and theories relevant to individuals and families coping with long-term health deviations and their impact on society. Emphasis on knowledge and skills needed for advanced nursing practice. (Fall)

NUCI 6106. Health Care Management of Adults I. (3) Prerequisite: BIOL 6050 Special Topics in Physiology (Pathophysiology), NURS 6230 and 6220. Corequisite NUCI 6100. Designed to provide students with the opportunity to integrate knowledge from advanced assessment. Pathophysiology, pharmacotherapeutics, theory and research to provide the advanced practice nurse with the requisite skills in the management of acutely ill adults with chronic illness in a variety of settings. Emphasis is placed on the use of diagnostic reasoning skills in the diagnosis pharmacological, and non pharmacological management of acutely ill adults with chronic illness. Application of models and theories to guide advanced nursing practice and planned research based care of adult with chronic illness is expected. (Fall)

NUCI 6107. Health Care Management of Adults II. (3) Prerequisite: NUCI 6106. Builds on knowledge of advanced assessment, pathophysiology, pharmacotherapeutic, and theory and research to provide the advanced practice nurse with the framework to manage adults with chronic illness in the ambulatory setting. Emphasis is placed on a wellness focus in the care of adults throughout the life span with common reoccurring acute illnesses and stable chronic conditions. Models of health promotion, disease prevention, health education and wellness will be used to guide the advanced practice nurse in assessing, diagnosing and planning care for adults. The case study approach will be used as a framework to implement the diagnostic reasoning and clinical decision making process. (Spring)

NUCI 6401. Advanced Practice Nursing in Ambulatory Care. (4) Prerequisite: NUCI 6106. Corequisite NUCI 6107. Emphasis on the role of the advanced practice nurse in promoting health life-styles to prevent or minimize the effects of chronic illness. Students will incorporate critical thinking and diagnostic reasoning in assessing diagnosing, monitoring, coordinating, managing outcomes and communicating health care findings of adults and their families in ambulatory care settings. (Fall, Spring)

NUCI 6402. Advanced Practice Nursing in Acute Care. (4) Prerequisite: NUCI 6107. Focuses on the care of adults who have acute episodes of illness and require care in acute care settings. Emphasis is placed on alterations in oxygenation, metabolism, mobility, and immunity experienced by acutely ill adults. Students will incorporate critical thinking and diagnostic reasoning, in assessing, diagnosing, monitoring, coordinating, managing outcomes and communicating health care findings of adults. (Fall)

NUCI 6403. Advanced Practice Nursing in Chronic Care. (4) Prerequisite or Corequisite NUCI 6107. Focus on outcome management of chronically ill clients with multi-system problems. Emphasis on the role of the advanced practice nurse in helping chronically ill adults and their families manage the effects of and achieve optimum outcomes in chronic illness. (Fall)

NUCI 6601. Synthesis in Advanced Practice Nursing of Chronically Ill Adults. (3) Corequisite NUCI 6406. Emphasis is on synthesizing theory, research and practice to promote, maintain and restore health and quality of life in adults with chronic illness in the blended role of the Advanced Practice Nurse. Preparation to assume the role of the advanced practice nurse will include the development of resume, job description, and marketing techniques. This course will culminate in a capstone experience that integrates research, theory and practice. (Spring)

NUCN 6150. Health of Immigrant Populations in the United States. (3) Examines the health of immigrant populations within the context of nation of origin, migration and resettlement. Explores theoretical frameworks for understanding resettlement and subsequent health status. Examines the role of traditional healing modalities and essential components of culturally competent health care. (Alternate Years)

NUCN 6201. Community Theory and Assessment. (1) Corequisite NUCN 6401. Provides an overview of community health nursing with a focus on community organization and dynamics. Examines strategies of assessing community and community groups emphasizing culturally competent approaches. NUCN 6201 must be taken with the lab NUCN 6401 Lab. (Fall, Spring)

NUCN 6202. Advanced Nursing Care in the Community. (3) Prerequisite: NUCN 6201, NUCN 6401 or permission of the instructor. Focuses on community-based interventions which successfully work with communities to plan, implement, and evaluate health programs in urban and rural settings. Special emphasis is
on school health programs. Uses Healthy People 2010 and outcome evaluation in planning and implementing health programs. Explores use of social marketing in prevention programs. (Fall)

NUCN 6203. Prevention and Diverse Populations. (3) Focuses on theoretical and analytical perspectives of assessing risk and implementing prevention services in diverse populations with specific emphasis on Healthy People 2010. Ethics of access and resource distribution and culture in a global environment are stressed. (Spring)

NUCN 6204. Synthesis in Community Health Nursing. (2) Prerequisite: NUCN 6405, Pre or Corequisite: NUCN 6406, NUCN 6404. Corequisite NUCN 6404. Applies research and theoretical principles of community and school nursing practice, problem-solving and political process to clinical internship. Synthesizes and presents mastery of concepts. Must be taken with lab NUCN 6404. (Spring)

NUCN 6207. Management of Child and Adolescent Health in Schools. (3) Prerequisite: NURS 6230. Knowledge and skills for advanced management of the health of children and adolescents in schools. Builds on knowledge base of child and adolescent growth and development. Concepts of health promotion, family, behavioral health, cultural and environmental variations are integrated throughout the course. (Spring)

NURS 6210. Family Health in Advanced Practice Nursing. (2) Provides an overview of the family as the basic unit of advanced nursing care. Focuses on strategies of family assessment, family empowerment, and family health promotion. Includes reviews of relevant theories, concepts and research for the assessment and management of family health and the analysis of the socio-cultural context of families. (Fall, Spring)

NUCN 6401. Community Assessment Lab. (1) Corequisite NUCN 6201. Students conduct a community needs assessment for selected community agencies. Must be taken with NUCN 6201. 60 clinical hours. (Fall, Spring)

NUCN 6404. Synthesis in Community Health Nursing Lab. (1) Prerequisite: NUCN 6405, Pre- or Corequisite: NUCN 6406, NUCN 6204. Corequisite NUCN 6204. Clinical experience in a community-based agency or school applying principles of policy and politics in allocation and distribution of fiscal, material and human resources to address health needs. Must be taken with NUCN 6204. (Spring)

NUCN 6405. Community Health/School Nursing Internship I. (3) Prerequisite: NUCN 6201, 6401, HPKD 6189 or equivalent. Pre- or corequisite NUCN 6202, 6203. Provides clinical application that builds on course work. The internship is student-determined and designed to reflect population-based practice in multiple settings. The internship is precepted by a professional affiliated with a community-based organization. The internships are precepted clinical experiences that require 12 hours of practice per week. The total clinical hours for one semester are 180. The internship is assigned with the assistance of the course faculty and/or the student's advisor. NUCN 6405 and NUCN 6406 must be taken adjacent semesters as the internship in one agency extends over two semesters. (Fall, Spring)

NUCN 6406. Community Health/School Nursing Internship II. (3) Prerequisite: NUCN 6201, 6401, HPKD 6189 or equivalent. Pre- or corequisite NUCN 6202, 6203. Continuation of clinical application from NUCN 6405. The internship is precepted by a professional affiliated with a community-based organization. Internships require 12 hours of practice per week. The total clinical hours for one semester are 180. NUCN 6405 and NUCN 6406 must be taken adjacent semesters as the internship in one agency extends over two semesters. (Fall, Spring)

NUCN 6408. Clinical Residency in Nurse Anesthesia I. (3) Prerequisite: NUAN 6135. Clinical application of didactic material from the nurse anesthesia curriculum through beginning level practice in the role of a nurse anesthetist. Conferences during the clinical residency provide opportunities to review current research and practice issues. Pass/Unsatisfactory grading only. (Fall, Spring)

NUMH 6130 Advanced Psychiatric Mental Health Nursing Practice with Individuals (2) Prerequisite: NUMH 6200; Corequisite: NUMH 6430. Provides a framework for the examination and application of the therapeutic process by advanced psychiatric mental health nurses with emphasis on theories from nursing as well as psychiatric, behavioral, and cultural sciences. Focuses on the development of the advanced psychiatric mental health nurse in a managed care or traditional health care environment as an individual therapist. (Spring, Alternate Years)

NUMH 6135 Advanced Practice Psychiatric Mental Health Nursing Practice with Groups and Communities (2). Prerequisites: NUMH 6130 & 6430; Corequisite: NUMH 6435. Examination of the therapeutic process of advanced psychiatric mental health nursing with emphasis on groups and communities. Focuses on development of the roles of the advanced practice nurse in a managed care and traditional mental health care environment as a group therapist in the promotion of mental health in community settings. (Fall, Alternate Years)

NUMH 6200. Psychiatric Mental Health Theories and Constructs of Mental Health Care. (3) Prerequisite: or Corequisite NURS 6101. Examination of theoretical frameworks underlying the practice of advanced psychiatric mental health nursing. Integration of biological, psychological, sociological and nursing theories
into the student's individual theoretical framework for practice. (Fall, Alternate years)

NUMH 6201 Seminars in Advanced Practice Psychiatric Mental Health Nursing (1). Prerequisites: NUMH 6135 & NUMH 6435; Corequisite: NUMH 6401. Focuses on the components and professional issues of the advanced practice psychiatric mental health nurse in the care of the individuals, groups, and communities. Professional practice issues will be addressed. One hour of seminar/case presentation. (Spring, Alternate Years)

NUMH 6401 Internship in Advanced Practice Psychiatric Mental Health Nursing (4) Prerequisite: NUMH 6135 and NUMH 6435; Corequisite NUMH 6201. Focuses on the application of the advanced practice psychiatric mental health nurse’s role in the care of the individuals, groups, and communities. Professional practice issues will be addressed with preceptors and faculty. 240 clinical practice hours. (Spring, Alternate Years)

NUMH 6430 Practicum in Advanced Practice Psychiatric Mental Health Nursing with Individuals (2). Prerequisites: NUMH 6200; Corequisite: NUMH 6130. Application of the individual psychotherapeutic process incorporating therapeutic modalities from nursing as well as psychiatric, behavioral, and cultural sciences in selected clinical experiences. Clinical seminar, clinical conference, and faculty/peer supervision provide opportunities for development of the advanced practice psychiatric mental health nurse in a managed care or traditional health care environment. 120 clinical practice hours. (Spring, Alternate Years)

NUMH 6435 Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities Practicum (2). Prerequisites: NUMH 6130 & NUMH 6430. Corequisites: NUMH 6135. Examination and application of the therapeutic process with emphasis on groups and communities. Clinical seminar, clinical experience and supervision, provide opportunity for development of the advanced practice psychiatric mental health nurse as a group therapist and in promotion of mental health in community settings in a managed care and traditional health care environment. 120 clinical practice hours. (Fall, Alternate Years)

NUNA 6175. Theory and Application of Administration to Nursing Systems. (3) Prerequisites: NURS 6101, NURS 6160. This practicum provides a guided experience in any agency or agencies appropriate for the students selected concentration area. Designed as a capstone course of the dual master's program in Nursing Service Administration and Health Administration. Students are expected to demonstrate theory and practice under the supervision of selected administrative preceptors. (Spring, every other year)

NUNP 6240. Advanced Primary Care of Women. (3) Prerequisite: NURS 6220, 6230, 6430, NUNP 6250 and 6450. Focuses on the role of the family nurse practitioner in the primary care of women family members. The course uses a developmental approach to provide knowledge needed for advanced understanding of common health concerns of women. Concepts of health promotion, health maintenance, cultural competence and environmental variations are integrated throughout the course. (Spring)

NUNP 6250. Advanced Primary Care of Adults. (3) Prerequisite: NURS 6210, 6220, 6230, 6430. Corequisite NUNP 6450. Focuses on the role of the family nurse practitioner in the primary care of adult family members. Uses a developmental approach to provide knowledge for advanced clinical decision making relating to adults with common health problems, acute episodic illnesses and stable chronic diseases. Concepts of health promotion, health maintenance, cultural competence and environmental variations are integrated throughout the course. (Fall)

NUNP 6260. Advanced Primary Care of Children and Adolescents. (3) Prerequisite: NURS 6220, 6230, 6430, NUNP 6250 and 6450. Corequisite NUNP 6460. Focus is on the role of the family nurse practitioner in the primary care of families with children and adolescents. The course uses a developmental approach to provide knowledge needed for advanced clinical decision making related to children with common health problems including acute episodic illness and stable chronic disease. Concepts of health promotion and maintenance and cultural and environmental variables are integrated throughout. (Spring)

NUNP 6400. Internship in Family Health Nursing. (4) Prerequisite: NUNP 6240, 6250 and 6260. Role of the family nurse practitioner in the assessment and management of the health of individuals and families across the lifespan. Implementation of clinical decision making skills in family health promotion and management of acute episodic and stable chronic conditions and consideration of professional practice issues. Includes one credit hour of seminar/case presentation and three credit hours of clinical practice (240 clinical hours) (Summer)

NUNP 6440. Advanced Primary Care of Women Practicum. (2) Prerequisite: NURS 6220, 6230, 6430, NUNP 6250, 6450. Corequisite NUNP 6240. This clinical course is designed to provide family nurse practitioner student with the opportunity to manage the healthcare of
women in primary care settings. The course uses a developmental approach to increase competence in providing care to women from diverse backgrounds. The focus is on the synthesis of knowledge from the physical and psychosocial sciences to formulate advanced clinical decisions effective in the health care of women and their families. 120 clinical hours. (Spring)

NUNP 6450. Advanced Primary Care of Adults Practicum. (2) Corequisite NUNP 6250. This clinical course is designed to provide family nurse practitioner students the opportunity to manage the health care of adults in primary care settings. The course uses a developmental approach to manage the care of adults from diverse backgrounds. The focus is on the synthesis of knowledge from the physical and psychosocial sciences to formulate advanced clinical decisions effective in the health care of adults and their families. 120 clinical hours. (Fall)

NUNP 6460. Advanced Primary Care of Children and Adolescents Practicum. (2) Prerequisite: NURS 6220, 6230, 6430; NUNP 6250, 6450. Corequisite NUNP 6460. This clinical course is designed to provide family nurse practitioner students the opportunity to manage the health care of children and adolescents in primary care settings. The course uses a developmental approach to guide management of the healthcare of children and adolescents from diverse backgrounds. The focus is on the synthesis of knowledge from the physical and psychosocial sciences to formulate advanced clinical decisions effective in the health care of children and adolescents and their families. 120 clinical hours. (Spring)

NURS 5090. Selected Topics in Nursing. (1-3) Prerequisite: Permission of instructor. Topics to be chosen from the specialties of nursing. May be repeated for credit as topics vary. No more than six hours of topics and/or independent study course credit in nursing may be applied toward degree requirements. (Fall, Spring)

NURS 6101. Theoretical Basis for Nursing Practice. (3) Philosophical foundations and knowledge development in nursing. Evaluation of theories, models and their relationships to practice. (Fall, Spring, Every other Summer)

NURS 6105. Roles and Issues in Advanced Practice Registered Nursing. (2) Examine issues affecting the emerging role of the advanced practice registered nurse. Designed to facilitate the role development of nurses who plan to practice within a specific clinical area of advanced nursing practice. Core concepts include subroles of advanced nursing practice, standards of practice, legal and professional issues affecting the Advanced Practice Nurse. Examination and discussion of current practice issues will provide a framework that will enable the student to assume the role of advanced practice registered nurse in the changing health care environment. (Fall, Spring)

NURS 6115. Health Policy and Planning in the U.S. (3) Overview of health care delivery system in the United States. Analysis of health care policy, financing, political trends, ethical, and professional issues, including the theoretical underpinning of policy making, the empirical thrusts of policy analysis and research and the relationship between policy making and the political process. (Fall, Spring)

NURS 6160. Research in Nursing and the Health Professions. (3) Prerequisite: Nursing Majors: NURS 6101; Health Education majors; HPKD 6143. Application of inquiry methods to problems in nursing and the health professions. (Fall, Spring)

NURS 6175. Nursing Informatics. (3) Adaptation of technological innovation (Informatics) to the field of nursing, including theoretical and applied computer utilization, patient acuity and quality assurance components to the professional practice of nursing. (On demand)

NURS 6176. Nursing Data. (3) Prerequisite: NURS 6175. Data-information-knowledge continuum in nursing and its application to practice, emphasizing identification, systemization and use of nursing data for decision support and expert judgment. (On demand)

NURS 6220. Pharmacotherapeutics in Advanced Nursing Practice. (3) Prerequisite or Corequisite BIOL 6050 Advanced Human Physiology. Principles of pharmacology and drug therapy for advanced nursing practice including legal and social considerations related to prescriptive authority and prescribing patterns. Satisfies NC Board of Nursing requirements for nurse practitioner. (Spring)

NURS 6230. Advanced Health Assessment and Diagnostic Reasoning. (2) Pre or corequisite: NURS 6101, BIOL 6050-Advanced Human Physiology. Corequisite NURS 6430. This course provides knowledge and skills necessary for advanced practice nurses to synthesize concepts from nursing and the biopsychosocial sciences in the comprehensive health assessment of adults and children. The diagnostic reasoning process, differential diagnosis, advanced health evaluation techniques, laboratory tests, diagnostic studies and interpretation and evaluation of findings are incorporated into the course. (Fall, Spring)

NURS 6430. Advanced Health Assessment Practicum. (1) Prerequisite or corequisite NURS 6101 and BIOL 6050 Advanced Human Physiology. Corequisite NURS 6230. This clinical practicum is designed to provide an opportunity for students to practice advanced health assessment skills on clients across the lifespan. Comprehensive health histories and physical examination techniques are used to complete a database on clients to formulate differential diagnoses and
NURS 6661. Research Seminar. (2) Prerequisite: NURS 6160 and graduate statistics. Application of inquiry methods to nursing problems including systematic observation and critical analysis of research methods. Submission of a written research or project proposal is required. (On demand)

NURS 6895. Independent Study. (1-3) Guided individual study in topics or issues related to nursing arranged with a faculty adviser. May be repeated for credit. No more than six hours of topics and/or independent study courses may be counted toward degree requirements. (Fall, Spring)

NURS 6962. Thesis. (1-3) Prerequisite: NURS 6160. Production of a piece of nursing research of investigation of a problem relevant to nursing which demonstrates contribution to professional knowledge through systematic investigation and participation in the process of peer reviewed research. (Fall, Spring)

NURS 7999. Graduate Residence. (1) Prerequisite: Consent of the adviser. Required of all graduate studies working on a thesis who are not enrolled in other graduate courses. (Fall, Spring)

SOCIAL WORK

Department of Social Work
351 Admissions Building
704-687-4667
http://www.uncc.edu/socialwork

Degree
M.S.W.

Chairperson
Dr. Philip Popple

Graduate Faculty
Linwood Cousins, Associate Professor
James Dudley, Professor
Elise Fullmer, Associate Professor
Deana Morrow, Associate Professor
Philip Popple, Professor
Marcia Shobe, Assistant Professor
Carole Winston, Assistant Professor

Program of Study
The Master of Social Work (MSW) degree prepares students for advanced social work practice with individuals, families, and small groups in public, voluntary, and proprietary human service settings. The program prepares students to address many of the social and individual problems/needs of people, particularly the low income and vulnerable populations.

The course of full-time study over four semesters requires 60 hours of course work beyond the bachelor’s degree from an accredited college or university. A structured part-time program is available that students can complete in four years with all classes, except field placement, scheduled at 3:00 p.m. or later. The UNC Charlotte Social Work Program has offered a CSWE accredited BSW degree since 1995. The department is applying for accreditation of the MSW degree and has been approved for candidacy. It is anticipated that review for full accreditation will happen at the June 2003 Commission on Accreditation meeting. Accreditation will be retroactive for previous graduates.

The curriculum focuses on preparation for advanced social work practice in the range of human service agencies employing professional social workers, including youth and family agencies, child and adult protective services, schools, area mental health agencies, health care settings, and neighborhood service centers, as well as the rapidly expanding social services provided by the for-profit sector. During the first year, students will identify a field of practice for specialized study to be emphasized during their second year.

Additional Admission Requirements
Students begin in the Fall semester. In addition to the general requirements for admission to the graduate school, applicants for the M.S.W. program:
1) Must have a minimum grade point average of 2.75 for the last two years of their undergraduate work.
2) Must present evidence of having a liberal arts foundation for MSW study. Courses in college algebra, social statistics, human biology, and diversity studies are required. In addition, transcripts are evaluated for studies in the humanities, the social and behavioral sciences, and the physical sciences.
3) Social work applicants are required to submit the Statement of Purpose Form included in the graduate application package, but this should be expanded to four or five pages in length to include the following:
   a) Your reasons for seeking graduate social work education at this time. If you are currently working in a social service job, explain your reasons for pursuing further formal education. If you are changing fields, discuss your reasons for doing so. Explain why you are making this change now.
   b) How your life experiences have led you to seek a graduate social work degree. How do you account for your interest in social work?
   c) Your personal strengths and limitations for the practice of social work.
   d) The particular aspects of social work that interest you most.
   e) What you see yourself doing professionally five years in the future?
Degree Requirements

Foundation Curriculum (first year):

- SOWK 6101 Human Behavior and the Social Environment I: Individuals, families, and small groups (3)
- SOWK 6111 Social Welfare Policy I: Theory and philosophy of social welfare policy and programs (3)
- SOWK 6121 Social Work Practice I: Theories and skills in practice with individuals, families, groups (3)
- SOWK 6131 Social Work Research I: Introduction to social science research methods (3)
- SOWK 6202 Human Behavior and the Social Environment II: Groups, organizations, communities (3)
- SOWK 6222 Social Work Practice II: Theories and skills in practice with groups and communities (3)
- SOWK 6232 Social Work Research II: Philosophies and methods of evaluating social work practice and programs (3)
- SOWK 6441 Practicum I: Application of foundation knowledge, values, and skills to practice setting (3)
- SOWK 6442 Practicum II: Application of foundation knowledge, values, and skills to practice setting (3)
- SOWK 7112 History and Systems of Social Work Practice: Social and policy context of the evolution of social work practice theory and method development (3)

Advanced Curriculum (second year):

- SOWK 7103 Human Behavior and the Social Environment III: Theories of mental illness, DSM-IV (3)
- SOWK 7123 Advanced Interpersonal Practice with Individuals: Evaluation and intervention methods (3)
- SOWK 7124 Advanced Interpersonal Practice with Families: Diversity among family systems, intervention models (3)
- SOWK 7125 Advanced Interpersonal Practice with Small Groups: Group development and facilitation methods (3)
- SOWK 7443 Practicum III: Application of advanced knowledge, values, and skills to practice setting (3)
- SOWK 7444 Practicum IV: Application of advanced knowledge, values, and skills to practice setting (3)
- SOWK 7651 Field of Practice Seminar: Study of theory and practice issues of student’s specialty (3)
- Two Field of Practice Electives selected according to the student’s specialty (6)

Electives may be selected from the offerings of any department on campus, but must be approved by the student’s advisor prior to registration.
Individualized Field of Practice Specialization

All students in the MSW program will complete coursework leading to expertise in theories and techniques of social work practice with individuals, families, and small groups. In addition, each student will be required to select a field of practice from the areas of health, mental health, families, and children, and aging. Within these four general areas, students may select more narrow specializations. For example, a student may select adolescent mental health from within the mental health area, or child protection from the families and children area. Students specializing in aging will have the opportunity to earn a certificate in gerontology in addition to their MSW. Students will bear major responsibility for developing their own field of practice specialization, which they will do in three ways. The first is that students will be required to select topics for papers and projects in each class which are related to the student’s field of practice specialization. These papers and projects will be kept in a portfolio which will be evaluated by faculty during the final semester of the program. Second, students will be required to select at least two electives from courses related to their field of practice. Finally, the student’s second year field practicum will be in an agency related to the student’s field of practice specialization. The final semester students will complete a field of practice seminar in which they will write a major paper describing the individual field of practice area in which they have developed expertise.

The Field Placement

Placements are assigned from a variety of agencies and practice settings approved by the UNC Charlotte Social Work Program. Field Instructors, approved by the program, guide the student through learning experiences, coordinating field experiences with the concurrent classroom coursework. The first year of field placement will focus on generalist interpersonal practice skills. The second year of placement, in a different setting, focuses on specialized practice with a specific population. Advanced interpersonal practice skills are developed and refined during the second year of study.

In certain circumstances part-time students may complete one field placement in their place of employment. Developing a field placement in a student’s employing agency is a complex process requiring many things of the agency, and approval should not be assumed.

Placements will not be approved at agencies located more than fifty miles from campus.

State Certification

Graduates of the Program will qualify for State Certification at three levels: Licensed Clinical Social Worker, Certified Master Social Worker, and Certified Social Work Manager, issued by the North Carolina Certification Board for Social Work. In all of these cases, graduates must pass a state-sponsored exam. The LCSW requires, in addition, evidence of two years of post-masters clinical practice with LCSW supervision. Graduates who specialize in school social work will qualify for School Social Worker certification, issued through the North Carolina Department of Public Instruction.

Financial Assistance

Paid internships and assistantships are limited. Contact the department for more information.

Courses in Social Work

SOWK 601. Human Behavior and the Social Environment I. (3) Overview of theories related to human behavior with an emphasis on individuals and families, small groups, organizations and communities. Systems theories and theories related to disenfranchised groups including feminist theories are also integrated throughout the course. (Fall)

SOWK 611. Social Welfare Policy I. (3) History, theory, and philosophy of social welfare policy and programs in the United States. The policy making process, policy analysis, and implications of policy for program design and service delivery. Overview of current policies guiding social work practice in major areas of social welfare service delivery. (Fall)

SOWK 612. Social Work Practice I: Individuals, Families, & Groups. (3) The first course in a two-course foundation practice sequence. Introduces foundation skills and theories of culturally competent social work practice with individuals, families, and groups. Develops the ecological systems perspective of practice with an emphasis on client strengths and problem-solving processes within a context of adherence to social work values and ethics. (Fall)

SOWK 613. Social Work Research I. (3) Prerequisite: SOWK 6101, Human Behavior and the Social Environment I. Overview of theories related to human behavior with an emphasis on various theories of small groups, organizations and communities. System theories, social construction theories, and theories related to disenfranchised groups such as feminist theories and non-western, non-English speaking systems of thought are also integrated throughout the course. (Spring)

SOWK 620. Human Behavior and the Social Environment II. (3) Prerequisite: SOWK 6101, Human Behavior and the Social Environment I. Overview of theories related to human behavior with an emphasis on theories related to disenfranchised groups such as feminist theories and non-western, non-English speaking systems of thought are also integrated throughout the course. (Spring)
SOWK 6222. Social Work Practice II: Organizations and Communities. (3) Prerequisite: SOWK 6121, Social Work Practice I. The second course in the foundation practice sequence. Introduces foundational skills and theories of culturally competent social work practice with organizations and communities. Areas of focus include leadership development in nonprofit organizations and collaborative approaches to building and strengthening neighborhoods. (Spring)

SOWK 6232. Social Work Research II: Practice and Program Evaluation. (3) Prerequisite: SOWK 6131, Social Work Research I. The second course in the foundation research sequence. Introduction to a range of philosophies, methods, and activities involved in evaluation of professional social work practice and of social service programs. Both quantitative and qualitative approaches are explored. (Spring)

SOWK 6441. Social Work Practicum I. (3) Prerequisite or Corequisite: SOWK 6121, Social Work Practice I; SOWK 6101, Human Behavior and the Social Environment I. The foundation field practicum prepares students to apply generalist social work knowledge, skills, values, and ethical principles gained in the classroom to actual practice at a social agency. Students work in an approved field site under the supervision of a UNC Charlotte field instructor. (Fall)

SOWK 6442. Social Work Practicum II. (3) Continuation of SOWK 6441, Social Work Practicum I & Seminar. (Spring)

SOWK 6895. Directed Independent Study. (1-6) Prerequisite: Permission of the department and instructor to be obtained in the semester preceding the semester in which the course is to be taken. Guided individual study in topics related to Social Work that are not offered in the MSW curriculum or available through elective courses in other graduate programs at UNC Charlotte. (Fall, Spring, Summer)

SOWK 7090. Special Topics in Social Work. (3). A topics course that is only available for graduate credit. (On demand)

SOWK 7103. Human Behavior and the Social Environment III. (3) Prerequisite: SOWK 6202, Human Behavior and the Social Environment II. Overview of theories related to mental health and mental illness. Content on the responsible use of the Diagnostic and Statistical Manual of the American Psychiatric Association. Social Construction theories and theories related to deviance and social control will be emphasized. (Fall)

SOWK 7112. History and Systems of Social Work Practice. (3) Prerequisite: SOWK 6111, Social Welfare Policy I; SOWK 6121, Social Work Practice I. The first advanced course in both the practice and policy sequences. The development of social work practice theories is presented in the context of the historical evolution of society and specifically social policy. The interaction between social work’s professional aspirations, public and private social welfare policy, and the development of practice theories is emphasized. Particular attention is paid to the current trend toward privatization of social welfare services and the effect this is having on social work practice and social workers’ career paths and prospects. (Spring)

SOWK 7123. Advanced Interpersonal Practice with Individuals. (3) Prerequisite: SOWK 6222, Social Work Practice II. As a part of a three-course advanced practice sequence the focus if this course is on multi-theoretical and multi-method approaches for advanced interpersonal practice with individuals. Emphasis is on in-depth assessment, intervention, and evaluation of services with attention to time-limited and empirically supported methodologies. (Fall)

SOWK 7124. Advanced Interpersonal Practice with Families. (3) Prerequisite: Social Work 6222, Social Work Practice II. As a part of a three-course advanced practice sequence the focus of this course is on multi-theoretical and multi-method approaches for advanced interpersonal practice with families. Diversity among family systems and time-limited intervention models for social work practice with families are emphasized. (Spring)

SOWK 7125. Advanced Social Work Practice with Groups. (3) Prerequisite: SOWK 6222, Social Work Practice II. As a part of a three-course advanced practice sequence the focus of this course is on multi-theoretical and multi-method approaches for advanced interpersonal practice with small groups. Emphasis is on various approaches to group development and facilitation including social change, therapeutic factors, leadership, composition, contracting, goal setting, and evaluation. (Fall)

SOWK 7443. Social Work Practicum III. (6) Prerequisite: SOWK 6442, Social Work Practicum II. Corequisite: Enrollment in at least one advanced social work practice class (SOWK 7123, SOWK 7124, or SOWK 7125). Students work in an approved social service agency developing specialized social work skills in their area of focus. Students are expected to demonstrate advanced social work practice skills that indicate an integration of theories, research, and policies in relation to their area of specialization within interpersonal practice. (Fall)

SOWK 7444. Social Work Practicum IV. (3) Prerequisite: SOWK 7443, Social Work Practicum III. Corequisite: Enrollment in at least one advanced social work practice class (SOWK 7123, SOWK 7124, or SOWK 7125). Continuation of SOWK 7443, Social Work Practicum III. (Spring)
SOWK 7651. Field of Practice Seminar. (3)
Prerequisite: Student must be in the last semester of the M.S.W. curriculum. This is a capstone course in which the student prepares a comprehensive paper describing the major historical and current theories, philosophies, and research issues of social work practice, policy, and human behavior in the social environment, related to the field of practice in which the student has indicated a specialization. The student will be expected to present sections of the paper at least twice during the semester. (Spring)

SOWK 7627. Seminar in Advanced Practice: Supervision and Staff Training. (3) Prerequisite: Student must be in the last semester of the M.S.W. curriculum. Students may choose to satisfy their social work elective requirement with this course. This seminar is for students who anticipate working in traditional social welfare organizations in the public or private sectors. The focus of this seminar is on knowledge and skills that a social worker will need to succeed in practice in large organizations. Included is content on supervision, staff training and development, and the role of the professional in large organizations. (Spring)
The College of Information Technology at the University of North Carolina at Charlotte is the only school of its kind in the Carolinas. Its mission is an important one – to prepare the information technology professionals of tomorrow through cutting-edge research and partnerships with the community. Students help shape the future by participating in educational programs that respond directly to the needs of government and business. The College of Information Technology has been designated as a Center of Academic Excellence in Information Assurance Education from the National Security Agency. The world of data communication changes rapidly, and the UNC Charlotte College of IT advances the field with its combination of the latest science, industry expertise and dedicated faculty and students. Hard at work on a full spectrum of research topics, the College of IT has broken new ground in computer science, computer engineering, information systems and information technology applications.

Areas of interest to College of IT researchers include security and privacy, artificial intelligence, pervasive computing, robotics and wireless networks.

Graduate Degree Programs
- Master of Science in Computer Science
- Master of Science in Information Technology
- Ph.D. in Information Technology

Graduate Non-Degree Programs
- Certificate in Advanced Databases and Knowledge Discovery
- Certificate in Information Security and Privacy
- Certificate in Information Technology Management

Computer Science
Kennedy Bldg 201
704-687-6374
http://www.cs.uncc.edu

Degree
M.S.

Coordinator
Dr. Zbigniew W. Ras

Graduate Faculty
- C. Michael Allen, Professor
- Keh-Hsun Chen, Associate Professor
- Teresa Dahlberg, Assistant Professor
- Essam El-Kwae, Assistant Professor
- Jianping Fan, Assistant Professor
- Junsheng Long, Associate Professor
- Zbigniew Michalewicz, Professor
- Taghi Mostafavi, Associate Professor
- Kayvan Najarian, Assistant Professor
- Zbigniew Ras, Professor
- Min Shin, Assistant Professor
- K.R. Subramanian, Associate Professor
- Barry Wilkinson, Professor
- Xintao Wu, Assistant Professor
- Jing Xiao, Associate Professor
- Lech Banachowski, Professor
- Alicja Wieczorkowska, Assistant Professor

Adjuncts
- Lech Banachowski, Professor
- Alicja Wieczorkowska, Assistant Professor

Program of Study
The objective of the computer science program leading to the Master of Science degree is to provide advanced skills and knowledge in the planning, design, implementation, testing and management of computer systems. These skills are necessary for dealing with the problems encountered in business, industry, and governmental computer applications; for holding administrative or engineering positions requiring the planning and implementation of computer systems; for teaching computer science; and/or further study in computer science, in particular, for doctoral study.

The primary areas of interest are: biomedical information processing, computer networks and communication, computational intelligence, decision support systems, geometric reasoning, modeling and computation, graphics, multi-media and visualization, image processing and computer vision, intelligent information systems, knowledge discovery and data mining, parallel and distributed computing, robotic systems, and software engineering.

Minor in Operations Research
The Department of Computer Science participates in the program leading to an interdisciplinary graduate minor in Operations Research. See Operations Research Section of this Catalog for complete information and program requirements.

Additional Admission Requirements
In addition to the general requirements for admission to the graduate school, students applying for this program must have current working and academic knowledge of two higher languages (including at least one procedural language), algorithm analysis, and data structures; also a senior level computer science course in computer organization and architecture and two additional senior level computer science courses in systems and/or applications. Students with bachelor's degrees outside of
science and/or engineering may need additional subject area coursework, as determined by the department.

A bachelor's degree in a high quality computer science program or satisfactory completion of the Advanced GRE in computer science may be substituted for some or all of the subject area admission requirements. Individuals who have worked at a high professional level in the computer industry may be able to substitute work experience for some of the specific subject area requirements, subject to review by the department graduate committee.

Students must have an undergraduate grade point average of (or equivalent to) at least 2.8 (on a 4.0 point scale) and a junior/senior GPA of at least 3.0. A satisfactory score on the aptitude portion of the GRE is also required.

Qualified students who do not meet all of the above requirements may be considered for conditional admission and maybe required to take additional approved related courses. In this case the student must make grade of B or better in all of the suggested courses, in order to be fully admitted to the program.

Degree Requirements
Candidates for the Master of Science in Computer Science have the option of either:
1) completing 24 semester hours of course work and writing a thesis for six hours of credit; or
2) completing 30 hours of course work and completing a project.
Either option can be completed on a full or part-time basis.

All students will complete 6 hours of course work from an approved list of courses (3 hours in systems and 3 hours in theory); further, students, with approval of his or her academic advisor, will also complete 9 hours of course work towards an approved concentration of computer science, and an additional 9 hours (thesis option) or 15 hours (project option) of advanced technical elective coursework, to meet program requirements.

A maximum of six semester hours of graduate credit may be transferred from other institutions.

Assistantships
Financial assistance for qualified students is available on a competitive basis in the form of graduate teaching and research assistantships. Students that awarded assistantships are expected to choose the thesis option. The deadline for graduate teaching assistantship applications is March 31 for the following academic year. For detailed and updated information refer to the Computer Science Website.

All course descriptions follow the Certificate section.
ITCS 5128. Programming Languages and Compilers. (3) Prerequisite: consent of the department. Introduction to the concepts and techniques used in describing, defining, and implementing programming languages and their compilers. Introduction to parsing and parser construction; LL and LR grammars; syntax directed translation; data object representations; run time structures; intermediate languages; code optimization. (On demand)

ITCS 5141. Computer Organization and Architecture. (3) Prerequisite: ITCS 3182 or equivalent. Fundamentals of computer design; instruction set design, basic processor implementation techniques; pipelining; memory hierarchy; Input/Output. Cost/performance and hardware/software trade-offs. (Even, Fall/Spring) (Evenings)

ITCS 5145. Parallel Computing. (3) Prerequisites: ITCS 1215 and 3182 or consent of department. Types of parallel computers, programming techniques for multiprocessor and multicomputer systems, parallel strategies, algorithms, and languages. (Odd, Spring) (Evenings)

ITCS 5151. Intelligent Robotics. (3) Prerequisites: ITCS 1215 and MATH 2164, or consent of the department. General introduction to spatial descriptions and transformations, and manipulator position and motion. More study on robot planning, programming, sensing, vision, and CAD/CAM. (Even, Fall) (Spring) (Evenings)

ITCS 5152. Computer Vision. (3) Prerequisites: ITCS 1215 or MATH 2164, or consent of the department. General introduction to Computer Vision and its application. Topics include low-level vision, 2D and 3D segmentation, 2D description, 2D recognition, 3D description and model-based recognition, and interpretation. (Odd, Spring) (Evenings)

ITCS 5157. Computer-Aided Instruction. (3) Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/ costs of CAI. (On demand)

ITCS 5181. Microcomputer Interfacing. (3) Prerequisite: ITCS 3182 or equivalent, or permission of the department. Signal conditioning, A/D conversion, noise, transmission line effects, signal processing, D/A conversion and serial/parallel interfaces. (On demand)

ITCS 6010. Topics in Computer Science. (3) Prerequisite: consent of the department. Topics in computer science selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 6050. Topics in Intelligent Systems. (3) Prerequisite: consent of the department. Topics in intelligent systems selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 6080. Topics in Computer Engineering. (3) Prerequisite: consent of the department. Topics in computer engineering selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 6107. Formal Languages and Automata. (3) Prerequisites: one semester of discrete structures or consent of the department. Detailed study of abstract models for the syntax of programming languages and information processing devices. Languages and their representation; grammars; finite automata and regular sets; context-free grammars and pushdown automata; Chomsky Hierarchy; closure properties of families of languages; syntax analysis. (On demand)

ITCS 6110. Topics in Programming Languages and Compilers. (3) A continuation of material in ITCS 5128 with emphasis on advanced aspects of optimization, data flow analysis, and error discovery. (On demand)

ITCS 6111. Evolutionary Computation. (3) Prerequisite: ITCS 6114 or consent of the department. General introduction to optimization problems. Optimization techniques: hill climbing, simulated annealing, evolution strategies, and genetic algorithms. Evolution programming techniques. (On demand)

ITCS 6112. Software System Design and Implementation. (3) Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. This course is cross-listed with ITIS 6112 (Fall, Spring) (Evenings)

ITCS 6114. Algorithms and Data Structures. (3) Prerequisite: full graduate standing. Introduction to techniques and structures used and useful in design of sophisticated software systems. Records; arrays; linked lists; queues; stacks; trees; graphs; storage management and garbage collection; recursive algorithms; searching and sorting; graph algorithms; time and space complexity. (Odd, Fall) (Spring) (Evenings)

ITCS 6115. Advanced Topics in Algorithms and Data Structures. (3) Prerequisite: ITCS 6114. Continuation and extension of ITCS 6114. String matching; semi numerical algorithms; probabilistic algorithms; parallel
ITCS 6120. Computer Graphics. (3) Prerequisites: full graduate standing or consent of the department.
Introduction to the design and implementation of interactive graphics systems. Raster and vector display systems, I/O devices; graphics primitives and their attributes; raster algorithms and clipping; 2D/3D geometric transformations; 3D viewing and projections; hierarchical and procedural models; surface representation; color and lighting models; rendering algorithms; global illumination and texture mapping. (Fall)(Evenings)

ITCS 6130. Advanced Computer Graphics. (3) Prerequisite: ITCS 6120 or equivalent, or consent of the department. Implicit and parametric representation; cubic surfaces; advanced reflection models; global illumination models - ray tracing, radiosity; shadow algorithms, texture mapping; volumetric modeling and rendering techniques; animation; advanced modeling techniques; particle systems, fractals. (On demand)

ITCS 6132. Modeling and Analysis of Communication Networks. (3) Prerequisite: A course in communication networks, or consent of the department. The objective of this course is to develop an understanding of modeling and analysis techniques for communication systems and networks. The intent is to enable the student to understand how to comparatively analyze the cost and performance impact of network architecture and protocol design decisions. Modeling techniques for analytical analysis, simulation based analysis, and measurement based analysis will be presented. Concepts covered include validation/verification of models, workload characterization, metric selection, presentation and interpretation of results. A semester long analysis project will be undertaken. (On demand)

ITCS 6134. Digital Image Processing. (3) Prerequisite: full graduate standing or consent of the department. Cross-listed as ECGR 6118. Image perception; image types/applications; image restoration and enhancement; edge/boundary detection; image transformation; image segmentation; statistical and syntactical pattern recognition; image information measures and compression. (Even, Spring)(Evenings)

ITCS 6140. Data Visualization. (3) Prerequisite: Full graduate standing or consent of the department. Emphasis on the methodology and application of data visualization to scientific and engineering data; data types and models; visualization methods; volume visualization; scalar, vector and tensor fields; multi-variate visualization; visualization systems and models; visualization applications; visualization software and hardware; research issues and future trends. (Odd, Spring)(Evenings)

ITCS 6144. Operating Systems Design. (3) Prerequisite: ITCS 6114 or consent of the department.
Introduction to features of a large-scale operating system with emphasis on resource-sharing environments. Computer system organization; resource management; multiprogramming; multi-processing; file systems; virtual machine concepts; protection and efficiency. (Even, Spring)(Evenings)

ITCS 6148. Advanced Object-Oriented Systems. (3) Prerequisites: ITCS 6112 or equivalent. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. This course is cross-listed with ITIS 6148 (Spring)(Alternate Years)(Evenings)

ITCS 6150. Intelligent Systems. (3) Prerequisites: full graduate standing or consent of the department. To introduce core ideas in AI. Heuristic versus algorithmic methods; problem solving; game playing and decision making; automatic theorem proving; pattern recognition; adaptive learning; projects to illustrate theoretical concepts. (Fall)(Evenings)

ITCS 6153. Neural Networks. (3) Prerequisites: ITCS 6114. Topics include: Basic notions and models of artificial neural nets; single layer neural classifiers; multilayer one-way neural nets; single layer feedback networks; neural models of associative memory; self organizing neural nets; translation between neural networks and knowledge bases; applications of neural networks. (Even, Fall)(Evenings)

ITCS 6154. Heuristic Search. (3) Prerequisite: ITCS 6150. Heuristics and problem representation; heuristic-search procedures; formal properties and performance analysis of heuristic methods; game-searching strategies and heuristic programming; search with probabilities; knowledge-guided search. (On demand)

ITCS 6155. Knowledge-Based Systems. (3) Prerequisite: ITCS 6162 or consent of the department. Knowledge systems; knowledge discovery; association rules; query languages and operational semantics; decision systems; cooperative and collaborative systems; tree structured information systems; tree structured query languages; flexible query answering; chase algorithm based on rules; local and global ontologies; action rules; optimization problems for query answering systems. (Even, Spring)(Evenings)

ITCS 6156. Machine Learning. (3) Prerequisite: ITCS 6150 or consent of the department. Machine learning methods and techniques including: acquisition of declarative knowledge; organization of knowledge into new, more effective representations; development of new skills through instruction and practice; and discovery of
new facts and theories through observation and experimentation. (On demand)

**ITCS 6157. Visual Databases. (3)** Prerequisites: ITCS 6160 or equivalent. Topics include: Representation of visual content, querying visual databases, content-based interactive browsing and navigation, system architecture, similarity models, indexing visual databases, data models and knowledge structures, image retrieval by similarity, and video retrieval by content. (Even, Fall) (Evenings)

**ITCS 6158. Natural Language Processing. (3)** Prerequisite: ITCS 6150. Principles, methodologies, and programming methods of natural language processing including foundations of natural language understanding, namely: lexical, syntactic, and semantic analysis, discourse integration, and pragmatic and morphological analysis. (On demand)

**ITCS 6160. Database Systems. (3)** Prerequisite: ITCS 6114 or consent of the department. Introduction to principles of database design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. (Fall, Spring) (Evenings)

**ITCS 6161. Advanced Topics in Database Systems (3)** Prerequisite: ITCS 6160 or equivalent. Continuation of ITCS 6160. Topics include deductive databases; semantic query processing; intelligent and cooperative query languages; distributed databases; active databases; heterogeneous databases, multimedia databases; data and knowledge interchange; multidatabase systems; very large databases. (Odd, Spring) (Evenings)

**ITCS 6162. Knowledge Discovery in Databases. (3)** Prerequisite: ITCS 6160 or consent of the department. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms are covered. (Fall) (Evenings)

**ITCS 6163. Data Warehousing. (3)** Prerequisite: ITCS 6160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; techniques for data transformation and knowledge extraction; relations with enterprise modeling. (Odd, Spring) (Evenings)

**ITCS 6164. Design and Implementation of On-line Management Information Systems. (3)** Prerequisites: ITCS 6114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. (On demand)

**ITCS 6165. Coding and Information Theory. (3)** Prerequisite: knowledge of probability theory. Information theory; coding theory; Shannon's theorem; Markov process; channel capacity; data transmission codes; error correcting codes; data compression; data encryption. (Odd, Fall) (Evenings)

**ITCS 6166. Computer Communications and Networks. (3)** Introduction to the concepts of communication networks; Types of networks; wired and wireless media; communication architectures; network protocols; coding and modulation; multiplexing and multiple access; error and flow control; routing; Internet Protocols; transport protocols; Assignments include implementation and analysis of network protocols (Fall) (Evenings).

**ITCS 6170. Logic for Artificial Intelligence. (3)** Prerequisite: ITCS 6150 or consent of the department. Introduction to basic concepts of logic for artificial intelligence, including declarative knowledge, inference, resolution, non-monotonic reasoning, induction, reasoning with uncertain beliefs, distributed information systems, intelligent information systems, planning and intelligent-agent architecture. (On demand)

**ITCS 6171. Logic Programming. (3)** Prerequisite: ITCS 6150 or consent of the department. Prolog programming language; programming techniques in Prolog; foundations of logic programming including computability of Horn clause logic, completeness of resolution principle, complexity of unification algorithms, and verification of logic programs; principles of implementing logic programming systems; selected topics from applications of logic programming to expert systems, intelligent database systems, and/or natural language processing. (On demand)

**ITCS 6175. Computability and Complexity. (3)** Prerequisite: consent of the department. Study of computability, unsolvability, computational complexity. Concept of effective computability; recursive functions; mathematical models of computation; universal Turing machines; unsolvable problems; time and space complexity of computations; NP-completeness problems; sub-recursive hierarchies. (On demand)

**ITCS 6181. Switching and Automata Theory. (3)** Prerequisite: consent of the department. Topics include sets, relations, lattices, Boolean algebras; functional
decomposition and symmetric functions; threshold logic; multiple-valued logic; fault detection and fault tolerant design; finite state machines, incompletely specified machines, minimization; state identification and fault detection experiments; finite state recognizers. (On demand)

**ITCS 6182. Advanced Computer Architecture. (3)**
Prerequisite: ITCS 5141. Survey of existing and proposed architectures; pipelined, dataflow, restructurable, and supercomputer architectures. Multicomputer and multiprocessor architectures. Impact of VLSI on architecture. (Odd, Fall) (Evenings)

**ITCS 6183. Computer Arithmetic. (3)** Prerequisite: consent of the department. Principles, architecture, and design of fast two operand adders; multioperand adders, standard multipliers, and dividers. Cellular array multipliers and dividers. Floating point processes, BCD, and excess three adders, multipliers, and dividers. (On demand)

**ITCS 6184. Fault Tolerant Digital Systems. (3)**
Prerequisite: ITCS 5141. Design and analysis of fault tolerant digital systems including design techniques, qualitative and quantitative methods of evaluation, and available fault tolerant digital systems. (On demand)

**ITCS 6186. Application Specifics System Design and Simulation. (3)** Prerequisite: ITCS 5141 or equivalent or consent of the department. Project oriented course on techniques and methodology in design and development of special purpose systems valuable for business, healthcare, and industrial community; course content include system specifications, interface structure and data communication, interconnection architecture, and techniques for testing and debugging. (Fall) (Even years)

**ITCS 6220. Pattern Recognition. (3)** Prerequisites: Graduate standing. Topics include: Pattern pre-processing and feature extraction (entropy minimization, orthogonal expansion, Fourier expansion, Karhunen-Loeve expansion, PCA); linear decision functions; orthogonal and non-orthogonal systems of functions; pattern classification by distance functions (Nearest Neighbor, K-means, ISODATA); pattern classification by likelihood functions (Bayesian classifiers, estimation of probability density function); trainable classifiers (LMSE, Perceptron, multi-layer perceptrons, fuzzy classifiers); stochastic processes; classification on categorical attributes. (Odd, Fall) (Evenings)

**ITCS 6222. Biomedical Signal Processing. (3)**
Prerequisites: Graduate standing. Topics include: Fundamental techniques in processing, analysis, feature extraction, and classification of complex signals; origin and processing techniques for biomedical signals, including ECG, ENG, EEG, MEG, ERG, EMG, respiratory signals, blood sound, and pressure signals. (On demand)

**ITCS 6224. Biomedical Image Processing. (3)**
Prerequisites: Graduate standing, and Math 2164 or its equivalent. Topics include: Review of image processing and pattern recognition (2-D Fourier transforms, 2-D Wavelet transform, denoising of medical images); origin and processing of X-ray images; CT images; MRI images; ultrasonic images; PET images; thermal images; electrical impedance images; cross-registration between images of different source; stereotactic neurosurgery; stereotactic radiosurgery/radiotherapy; robot-assisted surgery. (Odd, Spring) (Evenings)

**ITCS 6267. Intelligent Information Retrieval. (3)**
Prerequisites: ITCS 6114 or consent of the department. Topics include: definition of the information retrieval problem, modeling the information retrieval problem, evaluation of information retrieval, query languages and operations, text processing, indexing and searching, parallel and distributed information retrieval, user interface and visualization, multimedia information retrieval, and information retrieval applications. (Even, Spring) (Evenings)

**ITCS 6690. Computer Science Seminar. (3)**
Prerequisites: At least 18 graduate ITCS/ITIS hours and consent of the department. Experience for the advanced M.S. student on current problems of computer design and application. (May be used by a student or small group of students to work with a professor on a topic of mutual interest. May be used to give a course on a topic announced in advance.) (On demand)

**ITCS 6880. Individual Study. (1-3)** Prerequisites: At least 18 graduate ITCS/ITIS hours and consent of the department. With the direction of a faculty member, students plan and implement appropriate objectives and learning activities to develop specific areas of expertise through research, reading, and individual projects. May be repeated for credit. (On demand)

**ITCS 7991. Computer Science Thesis. (1-3)**
Prerequisite: consent of the department. Graduate thesis research. Detailed exploration of an area of computer science chosen for thesis research. May be repeated for credit but no more than six hours may be applied to M.S. degree requirements. (Fall, Spring, Summer) (Evenings)

**ITCS 7999. Master’s Degree Graduate Residence. (1)**
See Department for Course Description. (Fall, Spring, Summer) (Evenings)
INFORMATION
TECHNOLOGY

College of Information Technology
CARC 316
704-687-6374
http://www.coit.uncc.edu

Degree
Ph.D.

Coordinator
Dr. Zbigniew W. Ras

Graduate Faculty
Gail-Joon Ahn, Assistant Professor
C. Michael Allen, Professor
M. Maureen Brown, Assistant Professor
Keh-Hsun Chen, Associate Professor
Bei-Tseng Chu, Professor
W. Douglas Cooper, Professor
Christopher Craighead, Assistant Professor
Teresa Dahlberg, Assistant Professor
Essam El-Kwae, Assistant Professor
Jianping Fan, Assistant Professor
John Gretes, Professor
Mirsad Hadzikadic, Associate Professor
Alice Johnson, Assistant Professor
Moutaz Khouja, Associate Professor
Ram Kumar, Associate Professor
Junsheng Long, Associate Professor
Zbigniew Michalewicz, Professor
Taghi Mostafavi, Associate Professor
John O’Malley, Assistant Professor
Kayvan Najarian, Associate Professor
Joseph Quinn, Professor
Zbigniew Ras, Professor
Stephanie Robbins, Associate Professor
Cem Saydam, Professor
Min Shin, Assistant Professor
Mike Smith, Assistant Professor
Antonis Stylianou, Associate Professor
Kalpathi Subramanian, Associate Professor
William J. Tolone, Assistant Professor
Robert Wilhelm, Associate Professor
A. Barry Wilkinson, Professor
Susan Winters, Assistant Professor
Xintao Wu, Assistant Professor
Wei-Ning Xiang, Associate Professor
Jing Xiao, Associate Professor
Yuliang Zheng, Professor

Adjuncts
Ilieva Ageenko, Assistant Professor
Bruce Anderson, Assistant Professor
Lech Banachowski, Professor
Alicja Wieczorkowska, Assistant Professor

Program of Study
The Ph.D. in Information Technology program is interdisciplinary and offers opportunities for students to
develop advanced competencies in a number of IT related fields. Students, in cooperation with faculty
advisors, design flexible programs of study tailored to address individual career goals.

Students who aspire to academic research can benefit from a strong research faculty of international stature and
exposure to practical applications of their specialties. Others seeking employment in industry, commerce, or
government are afforded the opportunity to participate in high-quality applied research. The program is also well
suited to those interested in pursuing a teaching career. Students may familiarize themselves with recent advances
in educational technology and can design a broad-based program of study.

Additional Admission Requirements
Admission is competitive. Preference is given to applicants with strong credentials and appropriate
undergraduate and/or professional preparation. Specific admission requirements for the program include:
1) A baccalaureate degree in a related field.
2) Excellent GRE or GMAT scores.
3) Working knowledge of two high level programming languages at the level achieved by a one semester
college course in each language.
4) Evidence of skills at the level of a college course in at least 3 of the following areas:
   1. Statistics,
   2. Differential and Integral Calculus,
   3. Discrete Math.,
   4. Linear Algebra.

Applicants whose native language is not English must score at least 550 in the Test of English as a Foreign
Language (TOEFL). In addition, they will be required to take an English Proficiency Examination before
beginning the first semester of study. Students who do not pass this examination must successfully complete
ENGL 1100 (English as a Foreign Language) with a grade of B or higher.

Only complete applications will be considered. The applicant must state how each requirement is satisfied and
include all supporting documentation.

Highly qualified individuals who do not meet all the prerequisites may be admitted with a clear agreement to
complete them.

Further documentation to support the application may include: evidence of scholarly and creative activity,
including publication list; awards; results in national or international contests related to information technology,
and the like.
Degree Requirements
To earn the Ph.D., students must complete at least 72 post baccalaureate credit hours. This will include at least 54 hours of course work beyond the bachelor's degree and 18 hours of dissertation research credit. A limited amount of transfer credit is allowed (see below for details).

Students are expected to excel in all course work. Graduation requirements mandate that students must achieve a minimum grade point average of 3.0. Receiving more than two C grades or a grade of U in any course will result in termination of the student's enrollment in the program. In this case, the student may not take any further graduate course work without being readmitted to the program. Readmission to the program requires approval of the Dean of the Graduate School on the recommendation of the Doctoral Committee for the Information Technology Doctoral Program (henceforth Doctoral Committee). The dissertation is graded on a pass/fail basis and, therefore, will not be included in the overall assessment of cumulative average.

Requirements for Admission to Ph.D. Candidacy
1) Appointment of an Advisory Committee of at least four faculty members. The Advisory Committee must be approved by the Doctoral Committee. In addition, the Graduate School will appoint a graduate faculty representative to the Advisory Committee.  
2) Completion of the comprehensive examinations (see below).  
3) Successful defense of the dissertation proposal.

Assistantships
Teaching and research assistantships are available on a competitive basis.

Transfer Credit
In accordance with rules of the UNC Charlotte Graduate School, students are allowed to transfer up to 30 semester hours of graduate credit earned at UNC Charlotte or other recognized graduate programs. In cases of applicants with records of exceptionally high quality, the Doctoral Committee, at its discretion, may request that the Graduate School approve transfer credit beyond the limit set by the Graduate School.

To receive transfer credit, students must file a written request and submit all necessary documentation to the Ph.D. coordinator. The Ph.D. coordinator will evaluate the application and make recommendations to the Doctoral Committee for final approval. In general, courses taken in Computer Science, and many courses taken in a Business School are regarded as appropriate. It should be emphasized that the student's Ph.D. Advisory Committee will make the ultimate decision as to what courses the student must take to complete study at UNC Charlotte.

Comprehensive Examinations

IT Core Examination
All students must pass the core IT examination based on the Information Technology Core, which includes:
- ITCS 8160 Database Systems Design and Management (3)
- INFO 8100 Research Methodologies (3)

One of the following:
- ITCS 8200 Information Systems Development (3)
- ITCS 8112 Software Systems Design and Implementation (3)

One of the following:
- ITCS 8150 Intelligent Systems (3)
- ITCS 8166 Computer Communications and Networks (3)
- INFO 8300 Business Telecommunications (3)

The core examination is offered in fall and spring semesters. Students must notify the Ph.D. coordinator in writing during the first two weeks of the semester in which s/he wishes to take the exam.

The core examination may be taken at most twice, at different semesters. The second failure will result in termination of the student's enrollment in the Ph.D. program.

Area examination
Each student must pass an area examination. The area examination will be based on a body of courses, consisting of at least two related courses, chosen by the student and approved by both the student's Advisory Committee and the Doctoral Committee.

Students must notify the Ph.D. coordinator in writing during the first two weeks of the semester in which s/he wishes to take the exam. The notification must include the proposed set of courses the exam is to cover, and the faculty who have consented to draft the exam.

The area examination may be taken at most twice, at different semesters. The second failure will result in termination of the student's enrollment in the Ph.D. program.

Ph.D. Candidacy
Each student must present and defend a Ph.D. dissertation proposal. The exam will be conducted by the student's Advisory Committee and will be open to the Ph.D. IT faculty and students. At the discretion of Advisory Committee, the defense may include questions that cover student's program of study and background knowledge in the area of the proposal.

A doctoral student advances to Ph.D. candidacy after the dissertation proposal has been successfully defended.
The second failed defense of a dissertation proposal will result in termination of the student's enrollment in the Ph.D. program.

Dissertation
The student must complete a research program approved by the student's dissertation advisor that yields a high quality, original and substantial piece of research. The Ph.D. dissertation describes this research result. The dissertation defense, where the dissertation is presented, is open to the public. A written copy of the dissertation must be made available to the Ph.D. IT Doctoral Committee, to each member of the Advisory Committee, and to the UNC Charlotte Library at least three weeks before the public defense. The date of the public defense must be publicly announced at least three weeks prior to the defense. The student must present the dissertation and defend it in a manner accepted by the Advisory Committee. The dissertation will be graded as pass/fail by the Advisory Committee and must be approved by the Dean of the Graduate School.

The failed defense of a dissertation will result in termination of the student's enrollment in the Ph.D. program.

Residency Requirements
The student must satisfy the residency requirement of one continuous full-time year (i.e., two consecutive semesters with the student being enrolled for at least nine graduate credit hours in each semester) after being admitted to the Ph.D. degree program.

Tuition Waivers
Out of state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

Research Opportunities/Experiences
Students may participate in many of the on-going research projects occurring at UNC Charlotte.

COURSES IN INFORMATION TECHNOLOGY - DOCTORAL

(Computer Science, Software and Information Systems, Business Information Systems and Operations Management)

Students can also select graduate level courses in other disciplines e.g. College of Business, College of Engineering.

ITCS 8010. Topics in Computer Science. (3)
Prerequisite: consent of the department. Topics in computer science selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 8050. Topics in Intelligent Systems. (3)
Prerequisite: consent of the department. Topics in intelligent systems selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 8080. Topics in Computer Engineering. (3)
Prerequisite: consent of the department. Topics in computer engineering selected to supplement the regular course offerings. May be repeated for credit as topics vary. (On demand)

ITCS 8107. Formal Languages and Automata. (3)
Prerequisites: one semester of discrete structures or consent of the department. Detailed study of abstract models for the syntax of programming languages and information processing devices. Languages and their representation; grammars; finite automata and regular sets; context-free grammars and pushdown automata; Chomsky Hierarchy; closure properties of families of languages; syntax analysis. (On demand)

ITCS 8110. Topics in Programming Languages and Compilers. (3)
A continuation of material in ITCS 5128 with emphasis on advanced aspects of optimization, data flow analysis, and error discovery. (On demand)

ITCS 8111. Evolutionary Computation. (3)
Prerequisite: ITCS 8114 or consent of the department. Introduction to optimization problems. Optimization techniques: hill climbing, simulated annealing, evolution strategies, genetic algorithms. Evolution programming techniques. (On demand)

ITCS 8112 Software Systems Design and Implementation. (3)
Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. This course is cross listed with ITIS 8112. (Fall, Spring)(Evenings)

ITCS 8114. Algorithms and Data Structures. (3)
Prerequisite: full graduate standing. Introduction to techniques and structures used and useful in design of sophisticated software systems. Records; arrays; linked lists; queues; stacks; trees; graphs; storage management and garbage collection; recursive algorithms; searching and sorting; graph algorithms; time and space complexity. (Odd, Fall) (Spring) (Evenings)

ITCS 8115. Advanced Topics in Algorithms and Data Structures. (3)
Prerequisite: ITCS 8114 or equivalent. Continuation and extension of ITCS 6114. String matching; seminumerical algorithms; probabilistic algorithms; parallel algorithms; NP-completeness; computationally hard problems; approximation algorithms. (On demand)
ITCS 8120. Computer Graphics. (3) Prerequisite: full graduate standing or consent of the department. Introduction to the design and implementation of interactive graphics systems. Raster and vector display systems, I/O devices; graphics primitives and their attributes; raster algorithms and clipping; 2D/3D geometric transformations; 3D viewing and projections; hierarchical and procedural models; surface representation; color and lighting models; rendering algorithms; global illumination and texture mapping. (Fall) (Evenings)

ITCS 8130 Advanced Computer Graphics. (3) Prerequisites: ITCS 8120 or equivalent, or consent of department. Implicit and parametric representation; cubic surfaces; advanced reflection models; global illumination models - ray tracing, radiosity; shadow algorithms, texture mapping; volumetric modeling and rendering techniques; animation; advanced modeling techniques; particle systems, fractals. (On demand)

ITCS 8132. Modeling and Analysis of Communication Networks. (3) Prerequisite: A course in communication networks, or consent of the department. The objective of this course is to develop an understanding of modeling and analysis techniques for communication systems and networks. The intent is to enable the student to understand how to comparatively analyze the cost and performance impact of network architecture and protocol design decisions. Modeling techniques for analytical analysis, simulation based analysis, and measurement based analysis will be presented. Concepts covered include validation/verification of models, workload characterization, metric selection, presentation and interpretation of results. A semester long analysis project will be undertaken. (On demand)

ITCS 8134. Digital Image Processing. (3) Prerequisite: full graduate standing or consent of the department. Cross-listed as ECGR 6118. Image perception; image types/applications; image restoration and enhancement; edge/boundary detection; image transformation; image segmentation; statistical and syntactical pattern recognition; image information measures and compression. (Even, Spring) (Evenings)

ITCS 8140. Data Visualization. (3) Prerequisite: full graduate standing or consent of department. Emphasis on the methodology and application of data visualization to scientific and engineering data; data types and models; visualization methods; volume visualization; scalar, vector and tensor fields; multi-variate visualization; visualization systems and model; visualization applications; visualization software and hardware; research issues and future trends. (Odd, Spring) (Evenings)

ITCS 8144. Operating Systems Design. (3) Prerequisite: ITCS 8114 or consent of department. Introduction to features of a large-scale operating system with emphasis on resource-sharing environments. Computer system organization; resource management; multiprogramming; multi-processing; file systems; virtual machine concepts; protection and efficiency. (Even, Spring) (Evenings)

ITCS 8148. Advanced Object-Oriented Systems. (3) Prerequisites: ITCS 8112 or equivalent. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. This course is cross-listed with ITIS 8112 (Spring) (Alternate Years) (Evenings)

ITCS 8150. Intelligent Systems. (3) Prerequisites: full graduate standing or consent of the department. To introduce core ideas in AI. Heuristic versus algorithmic methods; problem solving; game playing and decision making; automatic theorem proving; pattern recognition; adaptive learning; projects to illustrate theoretical concepts. (Fall) (Evenings)

ITCS 8153. Neural Networks. (3) Prerequisites: ITCS 8114. Topics include: Basic notions and models of artificial neural nets; single layer neural classifiers; multilayer one-way neural nets; single layer feedback networks; neural models of associative memory; self organizing neural nets; translation between neural networks and knowledge bases; applications of neural networks. (Even, Fall) (Evenings)

ITCS 8154. Heuristic Search. (3) Prerequisite: ITCS 8150. Heuristics and problem representation; heuristic-search procedures; formal properties and performance analysis of heuristic methods; game-searching strategies and heuristic programming; search with probabilities; knowledge-guided search. (On demand)

ITCS 8155. Knowledge-Based Systems. (3) Prerequisite: ITCS 8162 or consent of the department. Knowledge systems; knowledge discovery; association rules; query languages and operational semantics; decision systems; cooperative and collaborative systems; tree structured information systems; tree structured query languages; flexible query answering; chase algorithm based on rules; local and global ontologies; action rules; optimization problems for query answering systems. (Even, Spring) (Evenings)

ITCS 8156. Machine Learning. (3) Prerequisite: ITCS 8150 or consent of the department. Machine learning methods and techniques including: acquisition of declarative knowledge; organization of knowledge into new, more effective representations; development of new skills through instruction and practice; and discovery of new facts and theories through observation and experimentation. (On demand)
ITCS 8157. Visual Databases. (3) Prerequisites: ITCS 8160 or equivalent. Topics include: Representation of visual content, querying visual databases, content-based interactive browsing and navigation, system architecture, similarity models, indexing visual databases, data models and knowledge structures, image retrieval by similarity, and video retrieval by content. (Even, Fall) (Evenings)

ITCS 8158. Natural Language Processing. (3) Prerequisite: ITCS 8150. Principles, methodologies, and programming methods of natural language processing including foundations of natural language understanding, namely: lexical, syntactic, and semantic analysis, discourse integration, and pragmatic and morphological analysis. (On demand)

ITCS 8160. Database Systems. (3) Prerequisite: ITCS 8114 or consent of the department. Introduction to principles of database design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. (Fall, Spring) (Evenings)

ITCS 8161. Advanced Topics in Database Systems. (3) Prerequisite: ITCS 8160 or equivalent. Continuation of ITCS 6160. Topics include deductive databases; semantic query processing; intelligent and cooperative query languages; distributed databases; active databases; heterogeneous databases, multimedia databases; data and knowledge interchange; multidatabase systems; very large databases. (Odd, Spring) (Evenings)

ITCS 8162. Knowledge Discovery in Databases. (3) Prerequisite: ITCS 8160 or consent of the department. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms are covered. (Fall) (Evenings)

ITCS 8163. Data Warehousing. (3) Prerequisite: ITCS 8160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; technizues for data transformation and knowledge extraction; relations with enterprise modeling. (Odd, Spring) (Evenings)

ITCS 8164. Design and Implementation of Online Management Information Systems. (3) Prerequisites: ITCS 8114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. (On demand)

ITCS 8165. Coding and Information Theory. (3) Prerequisite: knowledge of probability theory. Information theory; coding theory; Shannon's theorem; Markov process; channel capacity; data transmission codes; error correcting codes; data compression; data encryption. (Odd, Fall) (Evenings)

ITCS 8166. Computer Communications and Networks. (3) Introduction to the concepts of communication networks; Types of networks; wired and wireless media; communication architectures; network protocols; coding and modulation; multiplexing and multiple access; error and flow control; routing; Internet Protocols; transport protocols; Assignments include implementation and analysis of network protocols (Fall) (Evenings).

ITCS 8170. Logic for Artificial Intelligence. (3) Prerequisite: ITCS 8150 or consent of the department. Introduction to basic concepts of logic for artificial intelligence, including declarative knowledge, inference, resolution, nonmonotonic reasoning, induction, reasoning with uncertain beliefs, distributed information systems, intelligent information systems, planning and intelligent-agent architecture. (On demand)

ITCS 8171. Logic Programming. (3) Prerequisite: ITCS 8150 or consent of the department. Study of logic programming including computability of Horn clause logic, completeness of resolution principle, complexity of unification algorithms, and verification of logic programs; principles of implementing logic programming systems; selected topics from applications of logic programming to expert systems, intelligent database systems, and/or natural language processing. (On demand)

ITCS 8175. Computability and Complexity. (3) Prerequisite: consent of the department. Study of computability, unsolvability, computational complexity. Concept of effective computability; recursive functions; mathematical models of computation; universal Turing machines; unsolvable problems; time and space complexity of computations; NP-completeness problems; subrecursive hierarchies. (On demand)

ITCS 8181. Switching and Automata Theory. (3) Prerequisite: consent of the department. Topics include sets, relations, lattices, Boolean algebras; functional decomposition and symmetric functions; threshold logic; multiple-valued logic; fault detection and fault tolerant design; finite state machines, incompletely specified machines, minimization; state identification and fault
ITCS 8182. Advanced Computer Architecture. (3)
Prerequisite: ITCS 5141. Survey of existing and proposed architectures; pipelined, dataflow, reconfigurable, and supercomputer architectures. Multicomputer and multiprocessor architectures. Impact of VLSI on architecture. \((Odd, \ Fall) (Evenings)\)

ITCS 8183. Computer Arithmetic. (3) Prerequisite: consent of the department. Principles, architecture, and design of fast two operand adders; multiperand adders, standard multipliers, and dividers. Cellular array multipliers and dividers. Floating point processes, BCD, and excess three adders, multipliers, and dividers. \((On \ demand)\)

ITCS 8184. Fault Tolerant Digital Systems. (3) Prerequisite: ITCS 5141. Design and analysis of fault tolerant digital systems including design techniques, qualitative and quantitative methods of evaluation, and available fault tolerant digital systems. \((On \ demand)\)

ITCS 8186. Application Specifics System Design and Simulation. (3) Prerequisite: ITCS 5141 or equivalent, or consent of the department. Project oriented course on techniques and methodology in design and development of special purpose systems valuable for business, healthcare, and industrial community; course content include system specifications, interface structure and data communication, interconnection architecture, and techniques for testing and debugging. \((Fall) (Even years)\)

ITCS 8220. Pattern Recognition. (3) Prerequisites: Graduate standing. Topics include: Pattern pre-processing and feature extraction (entropy minimization, orthogonal expansion, Fourier expansion, Karhunen-Loeve expansion, PCA); linear decision functions; orthogonal and non-orthogonal systems of functions; pattern classification by distance functions (Nearest Neighbor, K-means, ISODATA); pattern classification by likelihood functions (Bayesian classifiers, estimation of probability density function); trainable classifiers (LMSE, Perceptron, multi-layer perceptrons, fuzzy classifiers); stochastic processes; classification on categorical attributes. \((Odd, \ Fall) (Evenings)\)

ITCS 8222. Biomedical Signal Processing. (3) Prerequisites: Graduate standing. Topics include: Fundamental techniques in processing, analysis, feature extraction, and classification of complex signals; origin and processing techniques for biomedical signals, including ECG, ENG, EEG, MEG, ERG, EMG, respiratory signals, blood sound, and pressure sounds. \((On \ demand)\)

ITCS 8224. Biomedical Image Processing. (3) Prerequisites: Graduate standing, and Math 2164 or its equivalent. Topics include: Review of image processing and pattern recognition (2-D Fourier transforms, 2-D Wavelet transform, denoising of medical images); origin and processing of X-ray images; CT images; MRI images; ultrasonic images; PET images; thermal images; electrical impedance images; cross-registration between images of different source; stereotactic neurosurgery; stereotactic radiosurgery/radiotherapy; robot-assisted surgery. \((Odd, \ Spring) (Evenings)\)

ITCS 8267. Intelligent Information Retrieval. (3) Prerequisites: ITCS 8114 or consent of the department. Topics include: definition of the information retrieval problem, modeling the information retrieval problem, evaluation of information retrieval, query languages and operations, text processing, indexing and searching, parallel and distributed information retrieval, user interface and visualization, multimedia information retrieval, and information retrieval applications. \((Even, \ Spring) (Evenings)\)

ITCS 8690. Computer Science Seminar. (3) Prerequisites: at least 18 graduate ITCS/ITIS hours and consent of department. Experience for the advanced Ph.D. student on current problems of computer design and application. (May be used by a student or small group of students to work with a professor on a topic of mutual interest. May be used to give a course on a topic announced in advance.) \((On \ demand)\)

ITCS 8112. Software System Design and Implementation. (3) Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. This course is cross listed with ITCS 8112. \((Fall) (Spring) (Evenings)\)

ITIS 8148. Advanced Object-Oriented Systems. (3) Prerequisites: ITIS 8112 or equivalent. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. This course is cross-listed with ITCS 8112. \(Spring) (Alternate Years) (Evenings)\)

ITIS 8156. Computer-Aided Instruction. (3) Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/costs of CAI. \((On \ demand)\)

ITIS 8163. Data Warehousing. (3) Prerequisite: ITCS 8160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the
limitations of relational databases and SQL queries; the
warehouse data models: multidimensional, star,
snowflake; architecture of data warehouse and the
process of warehouse construction; data consolidation
from various sources; optimization; techniques for data
transformation and knowledge extraction; relations with
transactions and knowledge extraction; relations with
enterprise modeling. This course is cross listed as ITCS 8163. (Odd, Spring) (Evening)

ITIS 8164. Online-Info Systems. (3) Prerequisites:
ITIS 6114 or consent of the department. The
fundamental concepts and philosophy of planning and
implementing an on-line computer system. Characteristics
of on-line systems; hardware requirements; modeling of
on-line systems; performance measurement; language
choice for on-line systems; organization techniques,
security requirements; resource allocation. (On demand)

ITIS 8167. Network and Information Security. (3)
Prerequisite: ITCS 6166 or equivalent. This course
examines the issues related network and information
security. Topics include concepts, security attacks and
risks, security architectures, security policy management,
security mechanisms, cryptographic algorithms, security
standards, security system interoperability and case studies of
the current major security systems. (Fall) (Evening)

ITIS 8177. System Integration. (3) Prerequisite: ITIS 5166 and ITIS 5160, or equivalents. This course examines
the issues related to system integration. Topics include:
data integration, business process integration, integration
architecture, middlewares, system security, and system
management. (Fall) (Evening)

ITIS 8200. Principles of Information Security and
Privacy. (3) Prerequisite: consent of the department.
Topics include security concepts and mechanisms;
security technologies; authentication mechanisms;
mandatory and discretionary controls; basic cryptography
and its applications; intrusion detection and prevention;
information systems assurance; anonymity and privacy
issues for information systems. (Fall) (Spring) (Evening)

(3) Prerequisite: ITIS 8200. This course discusses
objectives, formal models, and mechanisms for access
control; and access control on commercial off-the-shelf
(COTS) systems. This course also examines the issues
related to security architectures and technologies for
authorization. Topics include cryptographic
infrastructure, distributed systems security architectures,
Internet security architectures, network security
architectures and e-commerce security architectures.
(Spring) (Evening)

ITIS 8220. Information and System Assurance. (3)
Prerequisites: ITIS 8200. This course examines the issues
related to information and system assurance. Topics
include security policy, security
threats/vulnerabilities/risks/incidents, assurance
requirement, assurance class, evaluation methods and
assurance maintenance. (On demand)

ITIS 8342. Information Technology Project
Management. (3) Prerequisites: consent of the
department. Introduce the student to problems associated
with managing information technology projects involving,
particularly, integration of systems, development of
client-specific solutions, and project justification. The
course will move beyond the classic techniques of project
management and integrate communication
software/systems, multi-site, multi-client facilities
projects, cultural issues involved with managing
interdisciplinary teams, and the effect of rapid
technological obsolescence on project justification,
funding and continuance. (Spring)

ITIS 8362. Information Technology Ethics, Policy,
and Security. (3) Prerequisites: HADM 6152 or MBAD 6121 or MPAD 6120. Management of Information
technology involves understanding the broader issues of
ethics, Policy and Security. The growth in Internet usage
and E-commerce require IT professionals to consider
issues pertaining to data protection, regulation, and
appropriate use and dissemination of information. The
course is designed to be team-taught by professionals in
the field. (Fall)

INFO 8100. Information Systems Research
Methodologies. (3) Prerequisites: Graduate standing or
permission of the instructor. A study of statistical and
research methods used in information systems research.
(Fall)

INFO 8120. Advanced Research Methodologies (3).
Prerequisites: INFO 8100 or consent of the department.
A study of advanced research methods used in business
administration and management information systems
research. (On demand)

INFO 8200. Business Information Systems: Analysis,
Design, and Management. (3) Prerequisites: MBAD 6121 or consent of the department. This course integrates
real-world concerns in developing business information
systems with research issues. Major topics include
the organizational value of information systems, selecting and
justifying information systems projects, alternative
systems development methodologies, Object-Oriented
analysis and design and UML, CORBA and middleware,
Component-based development, Outsourcing, and IS
project management. (Spring)

INFO 8300. Business Data Communications (3)
Prerequisites: MBAD 6121 or
consent of the department. This course integrates real-world concerns in developing business data
communications networks with technical and research
issues. Major topics include the fundamentals of data
communications, the regulatory environment, the OSI
and other models of data communications, LAN and WAN functions, and distributed applications. *(On demand)*

**ITSC 8880. Individual Study. (3)***  
Prerequisites: consent of department. With the direction of a faculty member, students plan and implement appropriate objectives and learning activities to develop specific areas of expertise through research, reading, and individual projects. May be repeated for credit. *(On demand)*

**ITSC 8991. Doctoral Dissertation Research. (0-9)***  
Individual investigation culminating in the preparation and presentation of a doctoral dissertation. *(Fall, Spring, Summer)*

**ITSC 9999. Doctoral Degree Graduate Residence. (1)***  
*(Fall, Spring, Summer)*

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**SOFTWARE AND INFORMATION SYSTEMS**

**Software and Information Systems**  
Location: Cameron Applied Research Center 305  
704-687-4770  
http://www.sis.uncc.edu

**Degree**  
M.S.

**Coordinator**  
Dr. Bei-Tseng "Bill" Chu

**Graduate Faculty**  
**Professors**  
Bei-Tseng "Bill" Chu  
Yuliang Zheng

**Assistant Professors**  
Gail-Joon Ahn  
William J. Tolone

**Adjuncts**  
J. Foley, T. Kitrick, F. Williams,

**Program of Study**  
The objective of the information technology program leading to the Master of Science degree is to provide advanced skills and knowledge in the planning, design, implementation, testing, and management of applications of computing and communication technologies for business, industry, government, and other organizations.

The primary areas of interest are: information security and privacy, information integration, software engineering, information environment and pervasive computing applications, and knowledge management.

**Additional Admission Requirements**

1) In addition to the general requirements for admission to the Graduate School, the program requires applicants to have completed undergraduate course work, or equivalent, in an object-oriented programming language (e.g. C++ or Java) and in data structures with a minimum grade average of 3.0 on a 4.0 scale.

2) Students must have an undergraduate grade point average of at least 2.8 (on a 4.0 point scale) and a junior/senior GPA of at least 3.0.

3) A satisfactory score on the aptitude portion of the Graduate Record Examination or Graduate Management Admission Test is required.

4) Students with special backgrounds who do not meet all of the above requirements may be granted conditional admission.

**Degree Requirements**

A total of 30 graduate credit hours are required.

**Required courses include:**

- MBAD 6121 Business Information Systems
- One of ITIS 6112 Software System Design and Implementation or MBAD 6124 Business Information Systems Development
- One of ITIS 5166 Network-based Application Development or MBAD 6125 Business Data Communications
- ITIS 5160 Applied Databases (please note that ITCS 6160 can be a substitute for ITIS 5160)
- ITIS 6342 Project Management
- ITIS 6177 Systems Integration
- ITIS 6198 IT (internship) Project

**Important prerequisite considerations for required courses:**

ITIS 6177 requires ITIS 5166 and ITIS 5160 as prerequisites.

ITIS 6198 requires the completion of all other (six) required courses.

MBAD 6124 requires MBAD 6121 as a prerequisite.

The IT project may be substituted with a master's thesis. Each student must also complete a three-course (nine credit hours) sequence in an approved concentration area. Other concentration areas are possible with the approval of the MSIT Program Coordinator. In addition, the MSIT Program Coordinator can approve substitution of courses within approved concentrations. Details on concentration requirements are available on the department website and at the department office. Current concentrations include:

1) Advanced Data and Knowledge Discovery
2) Financial Service
3) Information Security and Privacy
4) Information Technology Management
5) Management
A maximum of six semester hours of graduate credit may be transferred from other institutions.

## Assistantships

Financial assistance for qualified students is available on a competitive basis in the form of graduate teaching and research assistantships. The deadline for graduate teaching assistantship applications is March 31 for the following academic year.

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### CERTIFICATE

**Information Security and Privacy**

http://www.sis.uncc.edu

**Coordinator**

Dr. Bei-Tseng "Bill" Chu

**Program of Study**

The purpose of the Certificate in Information Security and Privacy is to meet the needs of persons who are interested in pursuing a career in this important area of Information Technology. The proposed certificate program may also serve the education needs of IT-related professionals in the Charlotte area seeking more advanced knowledge of this fast growing field. The certificate requires 12 hours of coursework. The certificate may be pursued concurrently with a related graduate degree program at UNC-Charlotte.

**Admission Requirements**

For admission into the certificate program, applicants must meet the following requirements:

1. Applicant should hold a Bachelor's degree in a computer science, IT, mathematics, scientific, engineering, or business discipline.
2. Demonstrated knowledge of a modern object-oriented programming language such as C++ or Java, and background in data structures.
3. Applicants must either be enrolled and in good standing in a graduate degree program at UNC Charlotte, or have an undergraduate overall GPA above 2.8 (on a 4.0 scale) and a junior/senior GPA above 3.0.

Applicants are required to submit a brief (one-to-two page) statement of educational and work experiences. Application for this certificate program is made through the Office of Graduate Admissions.

**Coursework Requirements**

1. Take the following core course:
   - ITIS 6200 Information Security and Privacy (3)
2. Take two courses from the following elective courses:

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### CERTIFICATE

**Management of Information Technology**

http://www.sis.uncc.edu

**Coordinator**

Dr. Bei-Tseng "Bill" Chu

**Program of Study**

The Certificate in Management of Information Technology meets the demand for a growing number of individuals who are working in an IT related discipline and are interested in acquiring some formal IT training for career or educational purposes. The Certificate requires 15 hours of coursework. Some of the courses (indicated by asterisks) require substantial programming prerequisites.

**Additional Admission Requirements**

Admission requires that the applicant hold a Bachelor's degree from an accredited institution and that they meet the admission requirements of the UNC Charlotte Graduate School. Applicants must have an undergraduate overall GPA above 2.8 (on a 4.0 scale) and a junior/senior GPA above 3.0. Applicants must also have working knowledge of applications of Information Technology.

**Core Requirements**

Both of the following courses are required:

- ITIS 6342 Information Technology Project Management (3)
One of the following courses is required depending on student interests and/or background:
- HADM 6152 Information Resource Management (3)
- MBAD 6121 Business Information Systems (3)
- MPAD 6160 Information Systems in Public Administration (3)

Two electives from the following list is required:
- ITIS 6200 Principles of Information Security and Privacy (3)
- ITIS 6112* Software System Design and Implementation (3)
- ITIS 5160* Network-Based Application Development (3)
- GEOG 6615 Advanced Seminar in Spatial Decision Support Systems (4)
- INFO 6352 Electronic Commerce (3)
- MBAD 6122 Technology-Enhanced Decision Making (3)
- MBAD 6124 Business Information Systems Development (3)

* Requires knowledge of object-oriented programming language (e.g., Java), and data structures.

All requirements must be completed within four years from enrollment in the first certificate course.

COURSES IN SOFTWARE AND INFORMATION SYSTEMS

ITIS 5156 Computer-Aided Instruction. (3)
Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/costs of CAI. (On demand)

ITIS 5160 Applied Databases. (3)
Prerequisites: full graduate standing, or consent of department. Identification of business database needs; requirements specification; relational database model; SQL; E-R modeling; database design, implementation, and verification; distributed databases; databases replication; object-oriented databases; data warehouses; OLAP; data mining; security of databases; vendor selection; DBMS product comparison; database project management; tools for database development, integration, and transaction control. (Fall) (Evening)

ITIS 5166 Network-Based Application Development. (3)
Prerequisite: Full graduate standing or consent of the department. This course examines the issues related to network based application development. Topics include introduction to computer networks, web technologies and standards, network based programming methodologies, languages, tools and standards. (Spring) (Evening)

ITIS 6112 Software System Design and Implementation. (3)
Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. (Fall) (Spring) (Evenings). This course is cross-listed with ITCS 6112.

ITIS 6148 Advanced OO Design and Implementation. (3)
Prerequisites: ITIS 6112, or equivalent courses. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. (Spring) (Alternate Years) This course is cross-listed with ITCS 6148.

ITIS 6162. Knowledge Discovery in Databases. (3)
Prerequisite: ITCS 6160, full graduate standing, or consent of the department. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms will be covered. (Summer) (Evenings)

ITIS 6163 Data Warehousing. (3)
Prerequisite: ITCS 6160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; techniques for data transformation and knowledge extraction; relations with enterprise modeling. (On demand) This course is cross-listed as ITCS 6163.

ITIS 6164 Online-Info Systems. (3)
Prerequisites: ITCS 6114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. (On demand)

ITIS 6167 Network and Information Security. (3)
Prerequisite: ITCS 6166 or ITIS 5166 or equivalent. This
course examines the issues related to network and information security. Topics include concepts, security attacks and risks, security architectures, security policy management, security mechanisms, cryptographic algorithms, security standards, security system interoperation and case studies of the current major security systems. (Fall) (Evening)

**ITIS 6177 System Integration.** (3) Prerequisite: ITIS 5166 and ITIS 5160, or equivalents. This course examines the issues related to system integration. Topics include: data integration, business process integration, integration architecture, middleware, system security, and system management. (Fall) (Evening)

**ITIS 6198 IT Project.** (3) Prerequisite: consent of the department. Complete a team-based project that is originated from an IT organization and approved by the department.

**ITIS 6200 Principles of Information Security and Privacy.** (3) Prerequisite: Consent of the department. Topics include security concepts and mechanisms; security technologies; authentication mechanisms; mandatory and discretionary controls; basic cryptography and its applications; intrusion detection and prevention; information systems assurance; anonymity and privacy issues for information systems. (Fall, Spring) (Evening)

**ITIS 6210 Access Control and Security Architecture.** (3) Prerequisite: ITIS 6200. This course discusses objectives, formal models, and mechanisms for access control; and access control on commercial off-the-shelf (COTS) systems. This course also examines the issues related to security architectures and technologies for authorization. Topics include cryptographic infrastructure, distributed systems security architectures, Internet security architectures, network security architectures and e-commerce security architectures. (Spring) (Evening)

**ITIS 6220 Information and System Assurance.** (3) Prerequisite: ITIS 6200. This course examines the issues related to information and system assurance. Topics include security policy, security threats/vulnerabilities/risks/incidents, assurance requirement, assurance class, evaluation methods and assurance maintenance. (On demand) (Evening)

**ITIS 6342 Information Technology Project Management.** (3) Prerequisite: Consent of the department. Introduce the student to problems associated with managing information technology projects involving, particularly, integration of systems, development of client-specific solutions, and project justification. The course will move beyond the classic techniques of project management and integrate communication software/systems, multi-site, multi-client facilities projects, cultural issues involved with managing interdisciplinary teams, and the effect of rapid technological obsolescence on project justification, funding and continuance. (Offered: Spring)

**ITIS 6362 Information Technology Ethics, Policy, and Security.** (3) Prerequisite: HADM 6152 or MBAD 6121 or MPAD 6120. Management of Information technology involves understanding the broader issues of ethics, Policy and Security. The growth in Internet usage and E-commerce require IT professionals to consider issues pertaining to data protection, regulation, and appropriate use and dissemination of information. The course is designed to be team-taught by professionals in the field. (Offered: Fall)
THE CAMPUS

The UNC Charlotte campus is located off Harris Boulevard on NC 49 near its intersection with US 29, and only eight miles from the interchange of Interstates 85 and 77. Campus facilities are comprised of air-conditioned contemporary buildings. In addition to classrooms and well-equipped laboratories, the University offers arts and athletic facilities, cafeterias and residence accommodations. The campus is designed for the pedestrian and facilities are generally accessible to students with disabilities.

A map of the campus is included in the back of this Catalog. The Kennedy Building presently houses the Graduate Admissions Office and Graduate School. However, both of these offices will be moving to the New Admissions Office in July of 2002. The Reese Building houses many administrative offices. The Registrar’s Office is in the King building.

Campus Bookstore

The Bookstore offers new and used textbooks, non-required special interest and gift books, school supplies, computer software, greeting cards, gifts, and insignia clothing items. Services include “pre-packs of textbooks” specially designed for freshman and special ordering of books not carried in stock.

Campus Transportation

City Buses: The Charlotte Transit System city bus lines serve UNC Charlotte (#29 from South Park and #39 from Uptown). Service is provided on a regular schedule connecting with established routes throughout the city. During the week, the first bus arrives on campus at 6:40 or 6:55 a.m. and the last bus departs at 9:30 or 9:40 p.m. depending on the route. Brochures containing detailed information regarding routes, schedules and monthly TRAC passes may be obtained by calling the Charlotte Transit Authority at (704) 336-3366. Fees are set by Charlotte Transit and are subject to change.

Parking

All vehicles on campus must display a current decal or park in a visitor’s parking deck or in a metered parking space. To purchase a student parking decal students need to know the make, model, license plate number and insurance information of their automobile. Special hours for purchasing parking decals in the Cone University Center are established at the beginning of the fall and spring semesters. After these special hours end, all purchases or automobile registration changes are done directly in the Parking Services Office. Specific parking regulations are also available from this office. Decals are required the first Monday after classes start in the fall and spring semesters and on the first day of classes during both summer sessions. The Parking Services Office can be located at: the Auxiliary Services Building, 704-687-4285, (Web) http://www.uncc.edu/parking.

Police and Public Safety

The UNC Charlotte Office of Police and Public safety is responsible for maintaining a safe and pleasant environment in which members of the University community can live and learn. The 37 sworn police officers of the department are charged with the responsibility for protecting life and property, preventing and detecting crime at the University, as well as providing other essential services to members of the University community.

UNC Charlotte police officers patrol the campus on foot, bicycles, and in marked and unmarked police cars to help ensure your safety and the safety of the entire campus community. In addition to these patrol activities, the department maintains an investigative division that is responsible for conducting criminal investigations. If a classroom, laboratory, or other life-threatening emergency were to occur, you should call 911 immediately. The communications division of the campus police department will receive and dispatch your emergency call. This particular division also monitors alarms around campus and handles calls from all of the 150+ campus emergency phones.

Police officers in the department give crime prevention and awareness workshops on a routine basis, and they encourage requests from you for these presentations. As an alternative to a presentation, copies of crime prevention and awareness material can be obtained from the Police and Public Safety department. Please utilize this department’s resources; our campus police are here to help you in any way they can.

Recycling

As a state agency, UNC Charlotte is striving to meet North Carolina’s waste reduction goals. Recycling is available to all UNC Charlotte students, faculty, and staff. Aluminum cans and plastic and glass bottles can be recycled in yellow and red containers placed both inside and outside classroom and office buildings. Cardboard, office blend (white, color & fax paper, multi-part [carbonless] forms, file folders and computer paper) and news blend (newspapers, magazines, slick brochures, catalogs, soft back books, copier paper wrappers, and chipboard [i.e. envelope boxes]) papers can be recycled in all departments on campus. Hardback books, soft-back books, batteries, videotapes, diskettes, CDs, transparencies and printer cartridges can be recycled at each departments central recycling area. All cans, bottles, newspapers, magazines, and paper bags can be recycled at
the residence halls. The Recycling Office also has a food waste composting research project. Students are encouraged to utilize this program for their research projects. Dining Services offers a discount for using reusable mugs at all the campus dining locations. For more information about the Recycling Program call 704-687-2137 or go to our website http://www.uncc.edu/Recycling.

Safety and Accident Prevention
The Safety and Environmental Health Office is responsible for a university-wide program to establish and maintain a safe and healthy working, living, and learning environment for employees, students and visitors. Duties include accident prevention, safety inspections, safety training, fire prevention, life safety, occupational health, laboratory safety, radiation safety, biological safety, hazardous waste management, and Worker’s Compensation.

Personnel are available to work with members of the University community to reduce the risk of student or staff injury and may be consulted on special questions and issues. The Safety and Environmental Health Office can be located at 119 Garinger Building, 704-687-4291.

EDUCATIONAL SERVICES and FACILITIES

Adult Students and Evening Services (OASES)
Comprehensive student assistance is available after 5 p.m. Monday through Thursday. Evening students may consult with an academic advisor on undergraduate general education goals, pick up forms, publications, and make payments in OASES. Payments can be made by check, money order, or credit card (no cash) for tuition, applications, transcript requests, and other required fees. The Web Student View System is available, and well-trained staff members provide current, accurate information.

OASES assists adult students in making a successful transition to UNC Charlotte. Undergraduate orientation sessions, information about the Non-Traditional Student Organization (NTSO), and student newsletters are available to adult students through this office. In addition, private scholarships are awarded to adult students by the OASES program.

Office hours are Monday-Thursday, 8:00 a.m. - 7:00 p.m., Friday, 8:00 a.m. - 5:00 p.m., and Saturday 9:00 a.m. - 1:00 p.m. The office closes at 5:00 p.m. when classes are not in session. Check with the office for any special closings (typically during University holidays and breaks) each semester. OASES can be contacted at: 106 Barnard Building, (704) 687-2596, http://www.uncc.edu/OASES.

Computing Services
Computing Services provides the University's infrastructure to support instructional, research, and administrative computing. The campus has a robust data network. All student computing labs and offices have access to the commodity Internet and Internet 2. All students, faculty, and staff have an electronic mail account and, if desired, a web page account. There are over 42 student computing labs with a total of over 1150 stations. Many computing labs have specialized software and hardware. The University’s major systems, such as the library and electronic mail systems, are accessible from off campus using an Internet Service Provider. The University is a member of the North Carolina Research and Education Network, which provides access to the North Carolina Supercomputer Center and other state resources.

Disability Services (DS)
Disability Services provides educational opportunities for persons with disabilities through accessible programs, services, and a campus environment in compliance with disability rights legislation. Services include, but are not limited to: (1) testing accommodations, (2) note taker services, (3) interpreter services for students who are deaf, (4) taped textbooks, Braille and/or enlarged print for visually impaired students, (5) class relocation, (6) assistive technology loans, (7) priority registration, and (8) adaptive furniture.

Assistive technology is available to students with disabilities in the Disability Services Office, centralized computer labs, and the Atkins library. In accordance with State law, service animals assisting students with disabilities are permitted to all facilities on campus. DS does not provide prescriptive devices, devices of a personal nature, or personal attendance care.

The Disability Services Office also serves as a resource to faculty, staff, and the University community by providing consultation and advocacy services on issues related to compliance with the Americans with Disability Act of 1990.

Library
The J. Murrey Atkins Library is located near the center of the campus and houses an open-shelf collection that includes over 725,388 bound volumes and extensive microform collections. The Library of Congress classification system is used for the arrangement of books and periodicals, and an online catalog provides access to a substantial portion of the collection.

The Library offers state-of-the-art electronic access to local and worldwide resources. JASMINE, the Library’s online catalog, provides access to print and non-print resources located within the Library and available over
the Web. Networked multitasking computers with high speed printing and download capabilities provide electronic access to local research databases, electronic journals, full-text articles, and Internet connections to the world including NC Live, the North Carolina electronic initiative with access to thousands of databases. Web based access to Library electronic research materials is also available from other locations on- and off- campus, if license agreements permit.

A number of special collections are available. A selective depository of U.S. publications since 1964, Atkins Library has over 958,800 federal government documents including statistics, bibliographies and full text files on compact discs. The North Carolina documents collection, begun in 1976, is a rapidly growing collection of publications of state government agencies; the library was designated one of the first depositories for North Carolina documents in 1988. The Local Public Documents Room Collection for the McGuire Nuclear Plant on Lake Norman is located in the Library. Atkins Library also houses a growing collection of over 53,053 maps, ranging from USGS topographic quadrangles to historic WWII-era Defense Mapping Agency maps.

The Mary and Harry L. Dalton Rare Book and Manuscript Room houses collections of rare books, historical manuscripts, local government documents, and official University records. The 6,754 volume Rare Book Collection specializes in American literature, historical children's books, and English drama. The Manuscript Collections contain over one million unpublished papers, photographs, and architectural drawings relating to the history of Charlotte-Mecklenburg and surrounding counties, while the Local Documents Collection emphasizes printed materials issued by governmental bodies in the region. The University Archives and Records Management Program provides information support services for current University operations and preserves approximately one million items that document the history of the university.

Atkins Library meets the informational needs of the University community by offering a variety of services. Library staff provide assistance to users in locating information and in use of the library. The library offers general orientation tours during the fall semester. The reference staff offers an active library instruction program, which includes customized presentations and resource guides and instruction sheets on locating and using library resources.

For further information about Library resources and services check the Library's web page at http://www.libweb.uncc.edu.

**Media Services**

Media Services is located within the Information Commons of the J. Murrey Atkins Library. Profession staff provide assistance to faculty and students for instructional purposes in the areas of graphics, multimedia, video production, web design, and presentation support.

Faculty may develop multimedia and web related projects utilizing the hardware and software applications available in the multimedia resource lab. The lab is fully equipped with networked Macintosh and Gateway computers and scanners, as well as illustration, presentation, desktop publishing, digitization, multimedia, and web authoring software.

Students have access to networked computers to assist them in their research and productivity needs. Both black and white and color printing is available.

The unit manages a television studio and teleconference and teleclassroom facilities as part of two highly sophisticated, fully interactive video networks in conjunction with the Microelectronics Center of North Carolina, and the North Carolina Information Highway. Professional assistance is available upon request.

Additional services provided by the unit include consultation and assistance for multimedia development, web page development, graphic design, and instructional design and development. Digital imaging services, video and audio duplication, international video tape conversion, video tape editing (both analog and digital), slide duplication, original illustration for web and publications, web design and development, and web coursework training and support are also available.

**Office of the Associate Provost for Research**

The Office of the Associate Provost for Research provides direction and leadership for the development of research and creative activity at the University and the infrastructure that supports those activities. The Associate Provost coordinates federal and congressional relations and oversees three support offices, the Office of Proposal Development, the Office of Research Services, and the University Vivarium.

**The Office of Proposal Development** (OPD) works closely with faculty and funding agencies to identify opportunities for proposal development, facilitate the formation of proposal teams, and provide a wide range of services to help faculty achieve their research goals, including identification of funding sources, general consultation on writing and funding strategies, and proposal editing.

**The Office of Research Services** (ORS) provides services for the review and submission of proposals to funding agencies, including the interpretation of guidelines, preparation of budgets, and mailing and tracking of proposals, as well as post-award management support. ORS coordinates research-support efforts with college research officers and is responsible for federal compliance.
Office of International Programs
The Office of International Programs (OIP) offers academic and cultural programs to enhance the learning environment of the University community.

International Admissions
International Admissions is responsible for marketing UNC Charlotte to the world. The primary focus is those students who will attend on non-immigrant visas. International Admissions processes applications, evaluates credentials, serves as a consultant to prospective students, academic advisors, sponsors, and agencies representing international students, departments and the Graduate School. When students are admitted, the office provides documentation to the International Student Advisor for immigration purposes.

Education Abroad
UNC Charlotte encourages its students to study and live abroad as a part of their university career. The Office of Education Abroad offers students the opportunity to study or work abroad for a year, a semester or a summer. Programs are available in countries virtually all over the world. Deadlines for application for fall semester or year-long programs are in January, deadlines for spring semester programs are in September and deadlines for summer programs are generally in March or April. Contact the Office of Education Abroad for program information.

Faculty Development
The Office of International Programs serves as a facilitator for faculty exchange opportunities. Faculty are encouraged to work with the OIP staff in exploring and applying for a wide range of international exchanges. Among these are the Fulbright Exchange Program, reciprocal department exchanges, and exchanges based on agreements between UNC Charlotte and overseas institutions of higher learning. Faculty and administrators also are able to take advantage of OIP's professional development program. This program provides opportunities for the further enhancement of international interests through travel for international study and research and faculty colloquia on international topics.

International Student/Scholar Services
These services are designed to address the needs of foreign students and scholars in the areas of immigration, campus orientation and cultural understanding. The staff serves as a liaison to other campus offices on related matters and provides programs that enhance the student and scholar's learning experience including International Conversation Partners, The Host Family Program, advising of international student clubs, and cross-cultural training workshops.

Campus Programming
Various events are sponsored independently and in cooperation with other departments and agencies. They include the annual International Festival, dinners featuring specific cultures, the Education Abroad Fair, Summer Institutes, and the Chapter office of Phi Beta Delta Honor Society for International Scholars.

The English Language Training Institute (ELTI)
The Institute provides intensive English as a Second Language instruction for international students planning to attend American universities or colleges. ELTI holds three sessions per year--fall, spring, and summer--and offers seven language proficiency levels, beginning to advanced. Average class size is 12 students and students attend classes 20-24 hours per week. Exceptional students in Levels 6 and 7 are eligible to take University courses in addition to their English classes. ELTI also offers English language assessment and a communications course for international teaching assistants and language consulting for international faculty at UNC Charlotte.

Public Service
The OIP seeks to initiate and respond to the international needs and interests of the community. Current programs include: 1) Community Forums - symposia on topics of current international interest; 2) Great Decisions - annual series of lecture/discussions during the months of February and March on eight key policy issues; 3) Intercultural Outreach Programs - offers custom designed, short term training programs for international groups. These programs may include English language training, American cultural themes, and/or specialized professional development in any field, site visits and internships in the community, and a variety of cultural experiences tailored to meet the objectives of the group. Examples of recent groups include Korean university, Japanese and Taiwanese English teachers, Russian social studies teachers, Japanese bankers and business people, Korean telecommunications executives, and Korean government officials; and 4) Japan-America Society - a university-community joint venture to enhance understanding of Japan and U.S.-Japan relations; and 5) multi-tiered training in English under the auspices of the English Language Institute.

Student Employment Office
The Student Employment Office assists students in locating work on campus. The University participates in the federal Work-Study Program and attempts to match students with jobs related to their academic interests. Students are encouraged to limit employment hours to allow for success in a full 15-18 hour course load each semester. The Office is located at 101 King Building.

University Career Center
The University Career Center is a comprehensive career service that has received national recognition for “state-of-the-art” programs and services. The University Career center's design is to assist students in all stages of career development: career decision making, career planning, and career employment/placement. Experiential learning is one of the key components of career exploration.
allowing a student to work in their chosen field while gaining valuable career experience. The University Career Center helps coordinate these and other non-credit 49ership experiences in the student’s field of interest.

The Job Location and Development (JLD) Program assists students in obtaining part-time off-campus employment. Job listings and assistance are available with over 10,000 position vacancies listed along with links to recommended job search websites.

Services provided by the Center range from individual counseling on career transitions/changes, job search consultation and videotaped mock interviews to small group workshops on resume writing, interviewing techniques, uncovering the hidden job market, and transition to the world of work. Other services include on-campus interviewing, a career resource collection, seven job and career exploration fairs, and other special career programs. Please check out the Career Planning Guide on our website. Students are encouraged to visit the University Career Center during their first semester at UNC Charlotte.

The University Career Center maintains relations with over 1,100 area and national employers for job fairs, recruiting, consultations and other means to connect with potential candidates. The office also utilizes technology for service delivery and on-line registration for the On-Campus Interview and Experiential Learning Programs. We coordinate these programs through Campus Professional, our resume referral system.

The University Career Center can be located at: 150 Atkins Building, 704-687-2231, (Web) http://www.uncc.edu/career, (E-mail) career@email.uncc.edu.

University Learning Center
Designed to improve academic performance and foster meaningful learning experiences, the University Learning Center provides services, programs, and materials to help students develop and refine thinking skills, utilize learning and self-management skills, and learn course material more quickly and thoroughly while earning higher grades. Services include: 1) individual consultation and academic counseling regarding learning and self-management skills; 2) assessment of learning skills, learning styles, and study habits/attitudes; 3) computer-assisted instruction for a variety of course subjects; 4) learning and self-management skills workshops; 5) a library of materials with books, audio tapes, video tapes, and printed handouts outlining study/learning strategies; and 6) materials available for the GRE, GMAT, LSAT and other standardized tests.

University Writing Programs
The University Writing Programs consist of three units: 1) the University Writing Programs (UWP), 2) the Writing Resources Center (WRC), and 3) the UNC Charlotte Writing Project (WP). The Director of UWP provides faculty development opportunities such as faculty and classroom workshops, an annual retreat at Wildacres, curriculum-specific work with departments, and individual consulting.

The UWP and the WRC work in tandem to provide services, programs, materials, and academic support for both students and faculty in order to improve students’ writing skills and faculty writing pedagogy. The WP supports these efforts by working with K-12 teachers to influence their students’ writing skills and their teacher’s writing pedagogy. Both the UWP and the WRC support student support services by working with the University Learning Center, Disability Services and several other university departments.

Writing Resources Center
The Writing Resources Center (WRC) provides a free tutorial service for all UNC Charlotte students who want to become more effective writers. Students who come to the center work one-on-one with graduate and undergraduate tutors on any part of the writing process--planning, drafting, focusing, organizing, revising, or editing. Tutors help students understand their writing processes and learn strategies for writing successful papers at all levels and for all disciplines. WRC services include one-on-one tutoring, small group tutoring, student referrals, classroom workshops, small group workshops, library assistance, and on-line tutoring. Computer-assisted grammar instruction, handbooks and professional writing texts, and a limited number of PCs are available for student use in writing papers.

Chimney Rock Park Field Station
The Station is located in the Blue Ridge Mountains, 30 miles southeast of Asheville. The University has an agreement with Chimney Rock Park to investigate the biological, geological and cultural features of the 800-acre park. Area available for study extends from the Broad River at the bottom of Hickory Nut Gorge to the top, a vertical climb of over 1,500 feet.

UNC Charlotte Experimental Ecological Reserve
The Reserve is a 100-acre tract of land set aside on campus by the UNC Charlotte Board of Trustees as a permanent ecological reserve for use as an outdoor classroom and laboratory. The reserve includes a floodplain forest, pine stands, mixed pine-hardwood forest, and a relatively undisturbed 10-acre watershed of oak-hickory forest.

UNC Charlotte Rocky River Wildlife Refuge
The Refuge is a 46-acre natural area located east of Charlotte in Stanly County. Its purpose is to preserve the natural features of the area and allow research and field trips to study the plants and animals within the North Carolina slate belt formation.
UNC Charlotte Botanical Gardens
The Gardens, located on campus, consist of the McMillan Academic Greenhouse, the Van Landingham Rhododendron Glen, and the Susie Harwood Ornaments Garden. Begun in 1966, these gardens combine indoor and outdoor facilities for teaching, research and public display of a wide variety of native and exotic plants. The outdoor gardens are open seven days a week, and the greenhouses are open Monday through Saturday. Students and the public are invited to visit, free of charge.

STUDENT ACTIVITIES

The Student Government Association, Campus Activities Board, Student Media and Multicultural Resource Center are a few of the available organizations which can play a significant role in each student’s development and total education. There are over 130 registered student clubs in areas including academics, Greeks, religious, multicultural and international, sports and special interest. There are also opportunities in service involvement, wilderness experiences, and much more. Participation in activities increase a student’s opportunities to acquire leadership skills, develop interpersonal skills, develop personal talents and interests and make new friends.

Athletics
The UNC Charlotte Department of Athletics provides competition in 16 intercollegiate varsity sports for men and women. Each sport competes under the governing powers of the National Collegiate Athletic Association (NCAA) at the Division I level, which is the highest competitive level for collegiate varsity sports. UNC Charlotte is a member of Conference USA which offers sports in the following areas: Men-baseball, basketball, cross-country, golf, soccer, tennis, indoor track and field, and outdoor track and field; Women-basketball, cross-country, soccer, softball, tennis, volleyball, indoor track and field, and outdoor track and field. Conference USA members include: The University of Alabama at Birmingham, The University of Cincinnati, DePaul University, East Carolina University, The University of Houston, The University of Louisville, Marquette University, The University of Memphis, Saint Louis University, The University of South Florida, The University of Southern Mississippi, Texas Christian University, Tulane University, and UNC Charlotte.

Black Student Union
The Black Student Union (BSU) is an organization designed to address issues facing the African-American student community. The activities it sponsors include the annual Halloween Carnival, the Fall and Spring Step Shows, the Housekeeper’s Appreciation Day, and an annual Awards Banquet. This organization also produces a student-run publication "The Black Perspective" for the articulation of the voices of African-American students. BSU can be contacted at: 369G Cone Center (SGA Complex), 704/687-2191.

Campus Activities Board
The Campus Activities Board (CAB) works to enhance and unify the university community by planning social, cultural and educational events that complement the university’s academic mission. CAB committees are: Live Entertainment, Special Programs, Talks and Topics, Cone Connection Daytime Series, Feature Films and Spirit and Traditions. CAB is the largest student programming organization at UNC Charlotte and is responsible for planning diverse, quality events. Students are welcome and encouraged to become committee members and help in planning the events sponsored by CAB!

Center for Leadership Programs
The Center for Leadership Programs provides individuals with opportunities to develop leadership skills and abilities and provides the University and student organizations with more effective and efficient leaders. The goal is to provide a comprehensive and diverse program of leadership development activities for existing student leaders and potential leaders. The leadership is available to all students.

The program consists of several components (of interest to graduate students and graduate student organizations) each designed for a target group of campus leaders, members of their organizations or potential leaders of campus organizations.

- LeaderShape – a six day institute which focuses on leading with integrity.
- LEAD Team - students trained and compensated for leadership presentations to student organizations.
- Leadership Resource Area: Information on a variety of leadership topics for individuals and organizations.
- Individual and Group Consultation: Co-sponsorship of leadership conferences for Greeks, women, and African-American students.
- Peer Leadership Course: A 3-hour course in Communication Studies for students currently in leadership positions.
- PILOT: An individualized program students complete in order to receive Leadership Certification.

The Center for Leadership Programs can be reached at 704-687-2703.

Honorary Organizations
There are a number of national/international honor societies which have chapters at UNC Charlotte. Further information on each organization is available from the department or college offering the discipline.
Facilities and Services
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Intramural and Recreational Services
There is a comprehensive program to provide enjoyable recreational opportunities for UNC Charlotte students. The program includes team, dual and individual intramural sports for men and women, and ample opportunities for unstructured "free play" activities. In addition, there are 16 active sports clubs and a diverse schedule of group fitness classes available to the entire University community.

Non-traditional Student Organization
The Non-traditional Student Organization (NTSO) is a student government and OASES funded support group for adult students. For more information and membership forms, contact the Office of Adult Students and Evening Services (OASES) in 106 Barnard Building, (704) 687-2596. The NTSO phone number is (704) 687-2447, http://www.uncc.edu/ntso; E-mail address: nts0@email.uncc.edu

Outdoor Experiences
Venture offers experiential learning, non-credit courses and workshops in outdoor settings. Activities include weekend trips in a variety of outdoor sports from backpacking to kayaking, and programs at our on-campus team building course, high ropes challenge course, and indoor climbing wall. Venture programs are modeled on Outward Bound and are designed to facilitate individual growth through physical challenge, group interaction, and personal reflection. VOLTAGE (Venture Outdoor Leadership Training and Group Experience) trains student leaders to instruct Venture Programs. Venture houses a resource library to help individuals plan their own trips. Outdoor camping gear can be rented.

Student Activity Facilities
The James H. Barnhardt Student Activity Center provides a number of possible activities for UNC Charlotte students and their guests. On the first level the SAC offers an expansive Food Court with several food choices for the hungry. The second floor of the SAC houses the University's Game Room, with choices of video games, billiards, and table tennis, all at a nominal fee. The third floor of the SAC contains elegant meeting rooms, the SAC's Salons, which may be reserved for various functions. In addition, there are several quiet areas for relaxing and studying.

The lower level of the SAC features the campus fitness center. Here one can find cardiovascular machines, free weights, an aerobics studio, and spacious locker rooms. In addition, currently enrolled students may use their ID's to check out various equipment, such as weight belts, basketballs, volleyball, and even towels. From the lower level, students and guests may access the SAC recreational courts, indoor jogging track, and climbing wall, which are located inside the beautiful and multi-functional Dale Halton Arena. The arena is utilized for volleyball, basketball, and concerts, as well as other large events. The arena seats 9,106 patrons in fixed and telescopic seating.

The Belk Gymnasium offers recreational facilities as well. Inside the Belk are three recreational courts, a mini-gym, badminton, squash, racquetball, volleyball courts, and an indoor pool.

All currently enrolled students may utilize the SAC fitness center and recreational courts as well as the Belk Gymnasium facilities at no cost. Students may also bring up to two guests to enjoy the fitness facilities, for a small fee. Reservations are not required, but the fees must be paid upon entering the fitness areas. The Game Room is accessible to non-students as well. For additional information on the SAC and Belk Gymnasium guest policy, please call 704-687-4802.

Because the Barnhardt Student Activity Center and the Belk Gymnasium are multi-purpose facilities, part or all of the courts may be closed for special events.

Student Government Association
The Student Government Association (SGA) is operated by students for students. Campus-wide issues are debated in the Senate on campus. These issues are then represented on the Board of Trustees by the Student Body President, and formulated into policy proposals. The executive power of SGA is vested in the Student Body President and Student Body Vice President, their staffs, the Student University Advocates, the Student Defense Chief, the Secretary of the Student Body, and a number of committees to which the President appoints students each year.

The Student Senate of SGA includes the Student Body Vice President, the President Pro Tempore, the Treasurer and Committee Members who are among the 37 elected representatives. Campus-wide elections are held in September and April (fall and spring elections). This body has the responsibility of enacting law as necessary to promote the general welfare of the student body. The Senate meets every Wednesday at 5:00 p.m. and meetings are open to the campus community. The Senate approves the registration of all clubs and organizations (currently there are 130, from the African American and African Studies Club to the Young Alumni Chapter). The Senate also allocates funds to clubs and organizations.

The Student Judiciary of SGA is composed of 21 elected Hearing Panel Members, the University Advocate’s Office, and the Student Defense Office and their assistants. They have jurisdiction over cases involving violations of the Code of Student Responsibility, the Student Body Constitution, and various student statutes. To participate in SGA, students can run for election or apply for appointment. The SGA is in Cone University Center, 704-687-4606.

Student Media
The University Times. Serving the University community, The Times is distributed free to both on- and off-campus locations, bringing news, events, sports, and
features of importance to UNC Charlotte and the surrounding community.

**Media Marketing** is the advertising branch of Student Media responsible for contracting and sales of advertising for all student publications, generating campus promotions, special inserts and sections of *The Times*, as well as soliciting contributions for Student Media fundraising efforts, circulation, and subscriptions. There is no need to be a business or marketing major; a desire to make the program an exciting and successful one is all that is necessary. For information, phone 704-687-2160.

**Sanskrit Literary Arts Publication**, UNC Charlotte’s literary-arts magazine, publishes both student and non-student work in four categories: art, photography, short fiction, and poetry. *Sanskrit* is an excellent vehicle for exposure of student talent and creative efforts. Submissions are encouraged and are due in the fall. Guidelines for submitting material and deadline information are available through the Student Media Offices. Student Media can be contacted at: Cone Center, lower level, 704-687-2663.

**NinerOnline.com** is an online service providing news updates on a daily basis, as well as sports, entertainment and opinion columns of interest to the University community.

**Student Organizations**
The University has many student organizations which help meet the academic and social needs of UNC Charlotte students. Contact the Student Government Office, 704-687-4606, or visit http://www.uncc.edu/cone/clubs for a listing of the student organizations registered by the Student Government Association.

**STUDENT AFFAIRS and SERVICES**
The University of North Carolina at Charlotte provides a comfortable and enjoyable environment for students that is conducive to study. The services, facilities, and programs of the University promote individual student development and foster a community which promotes the involvement of students in their intellectual, cultural, spiritual, emotional, and physical development.

**Bonnie E. Cone University Center**
Cone Center serves as the hub of activity for informal gatherings and social and educational activities on campus and provides an attractive, comfortable place for relaxation and study. Services and facilities include a variety of meeting rooms and multi-purpose spaces, art galleries, an information desk and music listening lounge, TV Lounge, the Candy Shoppe/Ticket Counter, Creation Station (signs, banners, balloons, etc.), Campus Television Network, Campus Event Information Office, and Technical Services. A variety of activities, including concerts, movies, lectures, and banquets are provided.

Also located within Cone University Center are the offices of the Student Government, the Graduate and Professional Student Government, *University Times*, *Sanskrit*, Student Media Marketing, Black Student Union, Campus Activities Board, Resident Student Association, Venture Program, Office of Student Activities, Multicultural Resource Center, Student Activity Fees Business Manager, I.D. Office, Food Services and Conferences, Reservations and Event Services (located in the administrative offices of the University Center).

Building Hours: M-F: 7am-11pm; Sat: Noon-11pm; Sun: 1pm-11pm
Office Hours: M-F: 8am-5pm
Reservations Hours: M-F: 9am-4pm
Cone Center Main Office: 704-687-2267
Building Manager: 704-687-2810
Reservations: 704-687-2269

**After Hours and The Rathskeller**
After Hours (Cone Center) and The Rathskeller (Residence Dining Hall) can be reserved for dances and other events. The Campus Activities Board (CAB) and Campus Programs offer a wide variety of entertainment including name musical and novelty acts, lectures, movies, and diversity, women’s, and children’s programs.

**Counseling Center**
The Counseling Center provides services and programs that include personal counseling, career development, group counseling and testing.

The Center is staffed by psychologists and counselors who provide counseling designed to meet individual needs. Personal counseling helps each person address concerns that might include relationship problems, stress, anxiety, depression and a wide range of issues that can affect academic success. Information between students and their counselors is confidential in accordance with guidelines established by the American Psychological Association.

Career counseling guides students through career development decisions using methods including the exploration of personal interests, work values and abilities. This process utilizes resources such as individual counseling sessions, career exploration groups, the Career Resource Library, and use of the SIGI Plus computer-assisted career guidance system. The administration of career interest inventories, personality surveys and achievement tests provide an additional method of self-exploration for students.
Groups are offered each semester to teach a skill or focus on a particular theme. They are designed to address specific needs and focus on themes such as relationship issues, stress management, personal growth and career development. Therapy groups and discussion groups are also available.

Outreach and consultations are vital functions of the Counseling Center. Staff members are available to consult with faculty, staff and student organizations on topics such as enhancing communication, improving the learning environment and helping the problem student. Outreach activities are conducted outside the Counseling Center to meet the needs of groups and organizations. This includes training tailored to specific topics and programs geared toward student interests. The staff is also available to consult with Teaching Assistants who would like some advice in responding to student needs in the classroom. The Counseling Center can be contacted at: 158 Atkins Building, appointments can be made by calling 704-687-2105, http://www.uncc.edu/counseling_center/

Dean of Students Office
The Dean of Students Office is a department within the Division of Student Affairs and serves as a key link between students and other areas of campus and academic life. Various activities are sponsored by the Dean of Students Office to promote opportunities for learning and growth throughout a student's college experience. The staff is responsible for advising and promoting the following programs: student government, fraternities and sororities, minority student support services, new student orientation, commuter life, women's programs, student discipline, intramural and recreational services and volunteer services.

Staff services are available to all students. The staff of student development professionals provides support for students who have grievances or concerns about the University, students in crisis, and students experiencing medical emergencies. The office also coordinates and assists with the settlement of academic and social misconduct charges against individuals and student organizations. The Dean of Students Office can be contacted at: 217 King Building, 704-687-2375.

Dining Services
UNC Charlotte Dining Services provides a variety of options for the campus community. Our selection includes a variety of service styles, food choices, and methods of payment. We have restaurants located conveniently around campus. We offer two resident dining facilities, RDH and Crossroads Café, with an all-you-can-eat format, two a la carte facilities, Prospector Café and Main Street Market, and national brands Chick-fil-a, Burger King, and Pizza Hut. In addition, we offer two campus convenience stores, 49er Express and Crossroads Market. Check out the products at the campus convenience stores. They offer similar products to that of off campus convenience stores. All campus restaurants and convenience stores accept cash, declining balance, and 49er accounts.

Health Center
The Brocker Health Center provides a range of outpatient medical care to all University students. In addition to basic services, the Health Center houses a pharmacy, medical facilities for laboratory, X-rays and allergy injections, and a physical therapy department. Other services include specialized clinics for orthopedics, gynecology, and HIV screening.

Brocker Health Center is fully operational between the hours of 8:00 a.m. and 5:00 p.m., with physicians and support staff on duty Monday through Friday. Appointments are recommended. The Health Center is operational during both semesters as well as all summer sessions.

Seriously ill students and emergencies are referred to local hospitals or their appropriate medical facilities. In all cases, fees for such services are the responsibility of the student rather than the University. Students are urged to review their insurance plans to be sure they have adequate coverage for emergency treatment or hospitalization. The University does not provide health insurance for students needing non-acute care. For the convenience of students, information pertaining to private insurance coverage is available at the Health Center or Auxiliary Services.

Students coming to the Health Center must present their current University identification card. The Student Health Fee covers most of the cost for services at the Health Center, however, additional fees are charged for X-ray, pharmacy, laboratory and orthopedic services. Fees are subject to change. The Brocker Health Center is located on the southwestern quadrant of the campus, between the Belk Gym and Hunt Village apartments. The center can be contacted at: 704-687-4617 (general information), 704-687-4618 (appointments), http://www.uncc.edu/health_svcs

Health Insurance
Injury and sickness health insurance is available to students through Pearce & Pearce, underwritten by the Mutual of Omaha. The annual cost for basic coverage begins at $521 (student only) and subject to change each year. Insurance for spouses and children is available for an additional fee. Insured periods other than a full year are also available. The company mails information packets directly to domestic students. For additional information call 1-800-222-6491 or visit their website @http://www.studentinsurance.com for more detailed information. Read the materials carefully and return the purchase agreements directly to Pearce & Pearce. This program is administered through the Meal Plans, 49er Card and Insurance Office located in the Auxiliary Services Building, 704-687-2138 or 1-877-497-4949.
International students must have health insurance and should contact the Office of International Programs. Foreign Student adviser immediately upon arrival regarding their health insurance options.

Housing and Residence Life
The Department of Housing and Residence Life offers students a variety of living arrangements including Graduate/Nontraditional Student Housing in apartments. Hunt Village offers a quiet area that is conducive to the lifestyle of graduate students. Hunt Village apartments have four one-person bedrooms, a bath, living/dining area and kitchen. Kitchens include stoves and full-size refrigerators.

Apartment furnishings include a single bed, under-the-bed dresser, desk, chair, and cable TV/high speed Internet connections for each bedroom. Living areas include a couch and dining table and chairs. All apartments have window blinds and are air-conditioned. Other amenities include basic cable television, the Miner Movie channel featuring current movie titles and Time Warner’s “Road Runner” high-speed cable modem Internet service. Local telephone service, which includes voice mail, is provided to all residents. Several options are also available for summer housing. For information, contact the Department of Housing and Residence Life.

Students who plan to live on campus should apply as soon as possible as space is limited. An application for housing will be sent to the entering student who requests one following his or her final admission to the University. A $100 deposit is required when the application is returned to the Associate Vice Chancellor and Director of Housing and Residence Life.

Housing facilities designed specifically for students in wheelchairs are available. Wheelchair students who receive confirmation of residential space have priority in assignment to these facilities as long as the University is able to offer space. It is extremely important that the housing application is received before all space is committed so that this priority for assignment to appropriate facilities can be exercised. Wheelchair students may be considered for priority status on the waiting list on the basis of 1) the date of application and 2) the degree of utilization of wheelchair-equipped facilities as compared to the proportion of wheelchair students who apply.

Assignment to a wheelchair-accessible housing space, requires documentation of the disability and special needs in accommodations by the Disability Services Office. Documentation must be provided to Disability Services when the housing application is submitted and no later than June 1.

The University does not assume any responsibility for the provision of attendants for students with disabilities. Such arrangements are entirely the responsibility of the individual student and should be established well in advance of the time the services are to begin. Housing and Residence Life can be contacted at: Scott Hall, 704-687-2585, http://www.uncc.edu/housing, (E-mail) Housing@email.uncc.edu

Religious Affairs
As a tax-supported public institution, UNC Charlotte neither promotes nor recommends any religious orientation. However, the University recognizes that spiritual discernment and moral appreciation are essential to the development of the whole personality and has established an Office of Religious Affairs headed by a director.

The functions of this office include providing information to the campus community and general public about religious activities and programming as well as coordinating the activities of religious organizations in the University. These organizations provide a variety of services including prayer, pastoral and academic counseling, retreats, Bible study, marriage preparation, discussion groups, ecumenical activities, and social services. Faculty members, staff and students may obtain additional information by contacting the Office of Religious Affairs.

The religious associations listed below provide the services of their representatives to serve the spiritual needs of students and other members of the campus community.

- Baptist
- Catholic
- Episcopal
- Lutheran
- Methodist
- Presbyterian

These persons and other representatives can be contacted at: Office of Religious Affairs, 200 King Building, 704-687-2344.

Student ID’s
49er ID Cards are required of each UNC Charlotte student to be able to utilize many of the campus services and programs. ID Cards are valid throughout a student’s college career during semesters in which he or she is enrolled. Initial ID costs are paid for by student fees. Replacement cards are available for a cost of $10.00. ID Cards are made in the Dining Services/1D Office, located in the Cone University Center, adjacent to the Main Street Market Cafeteria. 704-687-2216. Website – http://www.uncc.edu/auxsvcs/

49er Account
Funds deposited into a 49er Account can be used anywhere on the UNC Charlotte campus where the 49er Account is accepted for payment of purchases. Currently, the 49er Account is accepted at all Dining Services locations, the UNC Charlotte campus bookstore, campus Copy Center, campus copiers, computer print labs, campus vending machines, residential laundries, the Cone...
THE UNIVERSITY and THE COMMUNITY

The University recognizes that its mission reaches beyond the borders of the campus to the surrounding region and the state. The University touches many facets of community life and serves as a catalyst for development of a regional approach to solving problems in education, economic development, transportation, the environment, cultural amenities, and the quality of life. Faculty, staff and students have made significant impact on the region through research, historic preservation, planning, the arts and literature, and the delivery of government and social services.

Alumni Affairs

The Office of Alumni Affairs, located in the Alumni House on Highway 49, serves as the liaison between the University and all graduates. The Director of Alumni Affairs is the chief administrative officer, coordinating activities of the office of Alumni Affairs and carrying out the objectives, goals and policies of the Alumni Association.

The Alumni Association's primary purpose is to involve alumni in the promotion, advancement, and support of the mission of UNC Charlotte and to develop and stimulate a continuing interest in our Alma Mater by providing opportunities for service, fellowship, and loyalty. A 32-member Board of Governors, elected by the active membership, establishes policy of the Alumni Association and assists in the planning and implementation of projects, events, and programs. Active members of the association are those alumni who make an annual donation to the University or the UNC Charlotte Foundation.

Programs of the Alumni Association include the Alumni Awards Banquet, regional and collegiate chapters, homecoming activities, networking socials, public affairs events, reunions, merchandising opportunities, group travel, athletic support, recognition of outstanding seniors, and sponsorship of the Student Alumni Ambassadors. Alumni have the opportunity to support academic excellence through the Alumni Association Scholarships which are awarded to four rising seniors annually.

The Alumni Association offers several services and products to alumni which directly support Alumni Scholarships. These include the web site, UNCC49ER.NET, temporary health insurance, home and auto insurance, rental car discounts, career services, credit card, graduate school test preparation, and several products unique to UNC Charlotte alumni such as watches, rings, diploma displays, and various items of apparel. All of these services and products are available through the Alumni Affairs Office or on-line through the Alumni Association web site.

The Alumni Association seeks to maintain lifelong contact with all graduates. Graduates are encouraged to become active in the Alumni Association and to notify the Alumni Affairs Office of address changes, employment information and other significant events, such as marriages, births and honors. In this way, adequate records can be maintained, and the Alumni Affairs Office can publish news about graduates in the UNC Charlotte Magazine. The Alumni Affairs Office can be contacted at: The Alumni House, UNC Charlotte, 9201 University City Blvd, Charlotte, NC 28223, 704-687-2273 or, for those outside Mecklenburg County, 1-800-PIK-UNCC; (Fax) 704-687-3962, (Web) http://www.uncc49er.net., (E-mail) alumni@email.uncc.edu.

Ben Craig Center

The Center, located in the University Research Park, is a non-profit incubator associated with UNC Charlotte. Its mission is to foster entrepreneurship in the Charlotte region. The Center accomplishes its mission by combining office infrastructure, consulting services, and a network of business contacts to create a program that accelerates a business’s growth.

Center for Mathematics, Science, and Technology Education

The Center works closely with teachers and school administrators in the twelve adjacent school systems to provide professional development activities for K-12 science and mathematics teachers to help them update and enhance their preparation in the cognate area and methodology. The Center offers academic year and summer programs on varied topics and of varied durations, as well as professional contacts through regional, state, and national science and mathematics organizations. Featured programs of the Center include both a Pre-College Program to enhance the mathematics and science academic background of underrepresented, minority, and female middle through high school students; and a Summer Ventures in Science and Mathematics program for academically talented high school students. For further information contact the Center for Mathematics, Science, and Technology Education at 704-687-4838.
Center for Professional and Applied Ethics
The Center for Professional and Applied Ethics provides educational outreach programs and ethics consultation to professionals locally, regionally, and nationally. Its Faculty Associates offer seminars, speakers, and ethics courses for pre-professionals in areas such as business, health care, engineering, architecture, information technology, biomedical research, criminal justice, and public policy. The Center regards itself as a public service center, the aim of which is to increase ethical awareness, dialogue, and activity in the public sector and world of enterprise. It also serves as a focus for discussion of ethical issues related to the professional and public lives of UNC Charlotte students and as a catalyst for the spread of ethics courses across the curriculum on its own and other campuses.

Continuing Education, Distance Education/Extension, and Summer Programs
Recognizing that learning must be a lifelong activity, the University provides opportunities for adults to pursue their continuing education through degree-related studies and special non-credit programs.

Continuing Education
Non-credit programs, seminars, workshops and conferences designed to keep adults current and productive in their professions are offered through Continuing Education. Specific programs are provided each year for the continuing professional education of accountants, architects, managers in the public and private sectors, engineers, nurses, psychotherapists and counselors, teachers and other school personnel, information specialists, and elected public officials. Special lectures and forums also are offered in the arts, sciences, humanities, and public policy for the personal enrichment of all interested citizens.

Distance Education/Extension
Through Distance Education/Extension, UNC Charlotte provides off-campus students with the opportunity to participate in selected undergraduate and graduate degree programs, graduate certificate programs, and courses required to obtain teacher licensure. Options for delivery include sending a UNC Charlotte faculty member to an off-campus location to teach a course in person, using one of two state-wide interactive video networks, or the Internet, to link a UNC Charlotte faculty member on the campus in Charlotte with students attending class at designated sites throughout the state, and transmitting asynchronous and/or synchronous instruction via the Internet to individuals participating from their homes or places of work. The two video networks currently utilized by UNC Charlotte are the North Carolina Information Highway (NCH) and the network maintained by the Microelectronics Center of North Carolina (MCNC). In addition, the university has the ability to deliver educational programming over Cable Channel 22, which is the channel reserved for the university by the local cable service.

Summer Programs
During the summer, the office schedules a variety of credit and non-credit programs on the campus and at approved off-campus sites. Non-credit programs are offered for children and youth as well as adults. The Office of Continuing Education, Extension, and Summer Programs can be contacted at 704-687-2424 for specific information about its programs.

Public Relations
The Office of Public Relations, located in the Reese Building, is the official communications channel through which the University disseminates information to its various publics. The Office has four major functions: (1) external media relations; (2) internal communications; (3) community relations; and (4) official University publications that are distributed to off-campus audiences. The Office distributes news and feature stories about University programs and its people as well as hometown releases about achievements of students. A weekly newsletter, Campus News, informs faculty and staff about campus activities. The Office maintains the University’s Home Page on the World Wide Web and provides assistance in printing official publications for University departments. The Office also publishes the University Magazine and operates the campus switchboard.

UNC Charlotte Foundation
The Foundation of the University of North Carolina at Charlotte was founded in 1960 and has had from its inception the goal of undergirding the University and assisting it in the quest for excellence. To accomplish its goals, the Foundation invites private contributions.

UNC Charlotte Uptown
The University offers selected upper division undergraduate and graduate courses and a variety of continuing education professional development programs at the Uptown facility, located at 220 North Tryon Street, on the third floor of the Mint Museum of Craft + Design. Classes are scheduled for the convenience of persons employed in or living near the central business core of the city. The entire MBA program may be completed at Uptown, and many courses from the Masters of Accountancy and Masters of Health Administration programs are held at this facility. Additional information, including directions, may be found at: http://www.uncc.edu/uptown

UNC Charlotte Urban Institute
The UNC Charlotte Urban Institute is a non-profit, non-partisan, applied research and consulting services outreach unit of the University of North Carolina at Charlotte. The Institute provides a wide range of services, including technical assistance and training, public opinion surveys, land-use and natural resources consulting, economic development research, and community
planning to meet the needs of the region and its citizens. Students may become involved with Institute projects as part-time research assistants or interviewers, or they may become involved with the Institute in conjunction with course work or degree requirements by writing term papers, graduate theses, or completing internships. The Institute’s program areas are:

**Community Research and Services** conducts needs assessments and citizen opinion surveys of both target and general populations focusing on a wide variety of issues, including transportation, growth, environmental awareness, healthcare, and government services. This division also offers group facilitation services, focus group research, evaluation research and support for strategic planning activities.

**Data Management and Strategic Planning** conducts research and strategic planning projects for public and private sector clients. Program staff members also manage databases for demographics, businesses and local officials. Types of analyses include economic development, population and growth patterns. Other types of projects include industrial targeting studies, housing research, and the publication of regional business and political directories.

**Land Use and Environmental Planning** conducts research for and provides planning services to county and municipal governments and to businesses and non-profit organizations in the central piedmont region of the Carolinas. Operates the Open Space Institute, which works collaboratively with regional land conservation organizations to define and achieve a shared regional open space vision, through education, research and planning. Maintains & provides access to a rich set of regional information resources in support of land use, open space and environmental planning.

**Technology Services and Training** is a division specializing in the application of computer technology to develop high-payoff solutions for public-sector clients. A major on-going project involves providing software support and training for a statewide computerized school bus routing project called Transportation Information Management Systems (TIMS). Other projects include, database design and desktop mapping, projects for economic development, social service agencies, and healthcare providers, conference planning and hosting, redistricting for school systems, and outreach projects.

**University Development**

Known traditionally as a “state-supported institution,” UNC Charlotte is more accurately a “state-assisted institution,” as the University depends on non-state resources for more than half of its operating needs. For this reason, philanthropy is critically important. Indeed, it provides the critical margin of excellence so that the University can fulfill its threefold mission of education, research and public service.

The Office of University Development plays a vital role by securing philanthropic support for the University, particularly through the establishment and enhancement of relationships with the University’s alumni, parents and friends, including corporations, foundations and organizations. The support can take many forms, such as gifts of cash, appreciated securities, real estate, equipment and works of art.

Philanthropy provides the resources for UNC Charlotte to recruit and retain outstanding faculty, to educate the leaders of tomorrow and to properly serve the Charlotte region. Also, it is quite possible to support UNC Charlotte and enjoy significant tax benefits at the same time. For more information, please call the Office of Development at 704-687-2271.
UNIVERSITY REGULATION OF STUDENT CONDUCT

As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of the UNC Charlotte community.

The University of North Carolina at Charlotte has enacted two codes governing student conduct. The University has also enacted a program for the prevention of the use of illegal drugs and alcohol abuse. All UNC Charlotte students are obligated to be familiar with these codes and to conduct themselves in accordance with the standards set forth.

THE UNC CHARLOTTE CODE OF STUDENT ACADEMIC INTEGRITY governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. The following conduct is prohibited in that Code as violating those standards:

A. Cheating. Intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices in any academic exercise. This definition includes unauthorized communication of information during an academic exercise.

B. Fabrication and Falsification. Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of altering information, while fabrication is a matter of inventing or counterfeiting information for use in any academic exercise.

C. Multiple Submission. The submission of substantial portions of the same academic work (including oral reports) for credit more than once without authorization.

D. Plagiarism. Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc., are common knowledge.

E. Abuse of Academic Materials. Intentionally or knowingly destroying, stealing, or making inaccessible library or other academic resource material.

F. Complicity in Academic Dishonesty. Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition.

THE UNC CHARLOTTE CODE OF STUDENT RESPONSIBILITY

Conduct Rules and Regulations

The following conduct, or an attempt to engage in the following conduct, is subject to disciplinary action: [Note: Letters j, p, and u have been intentionally omitted for continuity in record-keeping.]

A. Inflicting physical injury upon a person; placing a person in fear of or at risk of imminent physical injury or danger; committing sexual invasion, sexual assault, sexual misconduct, or sexual harassment as defined herein; inflicting severe mental or emotional distress upon a person through a course of conduct involving repeated abuse or disparagement; engaging in "fighting words" harassment as that term is defined in Policy Statement #95. The full text of this policy is available online or in the Office of the Dean of Students.

B. Using, possessing, or storing any weapon, dangerous chemical, or explosive without authorization.

C. Initiating or causing to be initiated any false report, warning, or threat of fire, explosion, or other emergency.

D. Interfering with normal University activities, including, but not limited to, teaching, studying, research, the expression of ideas, University administration, speeches and other public or private events, and fire, police or other emergency services. Acts prohibited by this rule include, but are not limited to, those acts prohibited in University Policy Statement #58, "Interference with University Operations," which prohibits student action taken "with intent to obstruct or disrupt any normal operation or function of the University," and Policy Statement #96, "Conduct at Speech Events," which prohibits certain disruptive activities at speech events on campus. Full texts of both policies are available online or in the Office of the Dean of Students.

E. Knowingly violating the terms of any disciplinary sanction imposed in accordance with this Code.

F. Possessing any controlled substance or drug paraphernalia, or manufacturing, selling or delivering any controlled substance or possessing with intent to manufacture, sell or deliver, any controlled substance. Minimum penalties and certain other requirements apply where controlled substance offenses are at issue, pursuant to University Policy Statement #87, "Program to Prevent Use of Illegal Drugs and Alcohol Abuse." That policy is available online or in the Office of the Dean of Students.
G. Setting fires, or misusing or damaging fire safety equipment or elevators.

H. Furnishing false information to the University or to a University official; misrepresenting or concealing one’s organizational affiliation(s) or sponsorship(s) for the purpose of enticing another person into joining or participating in a group or organization.

I. Forgery, unauthorized alteration, or unauthorized use or misuse of any document or instrument of identification (ID); displaying or using an ID that is not one’s own or is fictitious, canceled, revoked, suspended, or altered; counterfeiting, loaning, or selling an ID to another person not entitled thereto.

J. Theft or attempted theft of property or services, the unauthorized use or access to private or confidential information in any medium, possessing stolen property; or possessing property that is not your own without owner authorization.

K. Destroying or damaging the property of others or University property.

L. Failing to comply with the reasonable directions of University officials, including but not limited to campus police officers or Residence Life Staff, acting in performance of their duties.

M. Violating published University regulations or policies, as approved by the Vice Chancellor for Student Affairs. Such regulations or policies include but are not limited to the residence hall contract, as well as regulations relating to entry and use of University facilities, use of vehicles and amplifying equipment, campus demonstrations, and misuse of identification cards.

N. Possessing, consuming, or distributing alcoholic beverages without University authorization including but not limited to possessing or consuming alcoholic beverages by students below the legal minimum age; displaying or consumption of alcoholic beverages in campus residences by students less than twenty-one years of age; furnishing, or selling any alcoholic beverages to any person not of sufficient legal age to possess or consume such alcoholic beverage; failing to abide by the provisions of an Acknowledgment of Responsibility for Service of Alcoholic Beverages form; or making any sale of any alcoholic beverage on the University campus. (The full text of University Policy Statement #57, "Alcoholic Beverages," is available online or in the Office of the Dean of Students.)

O. Being present in or using University premises, facilities, or property without University authorization.

P. Using or possessing fireworks on University premises or at University activities without University authorization.

Q. Engaging in disorderly conduct such as fighting, threatening behavior, public disturbance, intentionally committing acts that disrupt or interfere with the normal functions of a class, or drunk and disorderly conduct.

R. Causing or permitting a person, in relation to membership in a society, club or similar organized group (whether or not recognized by the University), to participate in any activity that subjects that person or others to unnecessary risks of physical injury or extreme mental distress, whether or not such person has consented to participation in the activity. The full text of University Policy Statement #83, "Hazing," is available online or in the Office of the Dean of Students.

S. Engaging in computer abuse, including but not limited to unauthorized use or tampering with the operation of any University computer system including hardware and software; inspecting, modifying, or copying programs or data in University owned or controlled computing facilities without authorization or for purposes other than that for which authorization was given; disrupting or interfering with legitimate use of University computing systems by authorized users; using or copying any University software except as permitted under license; using University computing facilities to use or copy any software except as permitted under license; or violating University Policies #66 or 67 on computer and software use. (The full text of University Policy Statements #66, "Responsible Use of University Computing and Electronic Communication Resources," and #67, "Proprietary Software," are available online or in the Office of the Dean of Students.)

T. Gambling for money or other things of value except as allowed by law. Prohibited gambling includes, but is not limited to, betting on, wagering on, or selling pools on any University athletic event; possessing any card, book, or other device for registering bets, or bookmaking in connection with betting.

PROGRAM TO PREVENT USE OF ILLEGAL DRUGS AND ALCOHOL ABUSE (POLICY #87)

General. In keeping with efforts to maintain an environment that supports and encourages the pursuit and dissemination of knowledge, it is the policy of The University of North Carolina at Charlotte to consider the use of illegal drugs or alcohol abuse by students, faculty and staff or by others on premises under University control to be unacceptable conduct that adversely affects the educational environment.

Further, the University considers a sound awareness, education, and training program indispensable in combating illegal use of drugs and alcohol abuse, both as a preventive measure and as a remedy. The scope of the University program addresses the awareness needs of students, faculty, administrators, and other staff members and includes the following minimum components.

- The health hazards associated with the use of illegal drugs and with alcohol alone.
The incompatibility of the use of illegal drugs or abuse of alcohol with maximum achievement of personal, social, and educational goals.

The potential legal consequences (including both criminal law and University discipline) of illegal drug abuse.

The effective use of available campus and community resources in dealing with illegal drug abuse and alcohol abuse problems.

Responsibilities: It is the responsibility of all students, faculty, and staff to conduct themselves in such a way as to contribute to an environment free of illegal drug use and abuse of alcohol. Also students, faculty, and staff 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.

The Health Educator and the Assistant Director of Personnel for Training and Employee Relations are responsible for designing and carrying out a comprehensive program of awareness education and training for students, faculty, and staff on the subject of preventing the illegal use of drugs and abuse of alcohol. The Substance Abuse Prevention Committee will provide guidance and support to their efforts, which will be coordinated through the Vice Chancellor for Student Affairs as Coordinator of Drug Education.

The Director of the Counseling Center shall, within the limits of available resources, provide services and programs to students, faculty, and staff seeking assistance with problems of illegal drug use or alcohol abuse. Counseling Center services to faculty and staff are available under the University's Employee Assistance Program (EAP). In cases where the treatment needs of such students, faculty, and staff exceed the resources of the Center, the Center shall provide referral to appropriate facilities in the community.

Collaboration with Community Resources. The University's program emphasizes collaboration with local resources such as the Charlotte Drug Education Center, Council on Alcoholism and Chemical Dependency, Mecklenburg County Substance Abuse Services, Charlotte Treatment Center, Open House, Inc., Alcoholics Anonymous, Al-Anon, etc. To this end, the University shall participate in the Mecklenburg Coalition on Substance Abuse and will establish a local advisory board to further collaborate between the University and the Charlotte Community.

Education and Prevention Activities. The University's institution-wide awareness, education, and training efforts stress prevention. The goal of these efforts is (1) to encourage non-users of illegal drugs and alcohol to continue to be non-users, (2) to encourage users of alcohol to do so responsibly, and (3) to encourage users of illegal drugs to stop.

Illegal Use of Drugs and Abuse of Alcohol. The use of illegal drugs and the abuse of alcohol are considered by the University to be problems that can be overcome. Therefore, the educational and rehabilitative services mentioned above are available on a confidential basis. However, the possession, sale, delivery, or manufacture of illegal drugs will not be tolerated on campus or off campus in the event that the interests of the University may be affected. The University will cooperate fully with law enforcement agencies and will apply appropriate disciplinary processes should a student, faculty member, or staff member violate criminal statues with regard to illegal drugs. Violations subject a student, faculty member, or staff member to prosecution and punishment by civil authorities and to disciplinary action by the University. It does not constitute "double jeopardy" for the University to initiate its own disciplinary proceedings for the same offense when the alleged conduct is deemed to affect the interests of the University.

Disciplinary procedural safeguards applicable to one's status as a member of the University community will be followed. These are described in the following documents:

Status Document
- Students: UNC Charlotte Code of Student Responsibility
- SPA Staff: State Personnel Manual
- EPA Staff: EPA Non-Faculty Personnel Policy
- Faculty: Section 603 of the UNC Code and Section 6 of UNC Charlotte Tenure Document

Minimum sanctions described below in the Policy would also apply to employees who do not fall in any of the categories above. In the event a student is also an employee of the University, the minimum sanctions for employment as well as student status would apply.

The use of illegal drugs may lead to a variety of sanctions, from written warnings with probationary status to expulsion from enrollment or discharge from employment. However, in accordance with the Policy on Illegal Drugs adopted by the Board of Governors from the University of North Carolina, the following minimum penalties shall be imposed for the particular offenses described.

Trafficking in Illegal Drugs
1. 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. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90 (including, but not limited to, heroin, mescaline, lysergic acid diethylamide, opium, cocaine, amphetamine, and methaqualine), any student shall be expelled and any faculty member or staff member shall be discharged.
2. 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. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. For a second offense, any student shall be expelled and any faculty member or staff member shall be discharged.

Illegal Possession of Drugs
1. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent.
2. For a first offense involving the illegal possession of controlled substance identified in Schedule III through VI, N.C. General Statutes 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.
3. 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 or staff members.

Suspension for a Minimum Period of "One Semester or its Equivalent." This logically may be interpreted to mean, in the case of a student, forfeiture of at least one full semester of academic credit or attendance; this may be accomplished either (1) by suspending the student for the unexpired balance or the semester during which guilt is determined, with attendant loss of all academic credit for that semester, or (2) by placing the student on probation for the unexpired balance of the semester during which guilt is determined and suspending the student for the duration of the next succeeding semester; in the case of a faculty member or staff member, it may be interpreted to mean forfeiture of pay for a period of 18 weeks. Since the current State Personnel Act specifies that disciplinary suspensions cannot exceed three days, offense for which an 18-week minimum suspension is required by the Board of Governor's policy will result in discharge of an employee subject to the State Personnel Act.

Suspension Pending Final Disposition. When a student, faculty member, or staff member 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 or 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.

References. The use of alcoholic beverages on the University campus is regulated by Policy Statement #57, "Policy on Alcoholic Beverages." Policy Statement #62, "Employee Assistance Program," establishes a free employee assistance service as part of the University Counseling Center.

IMMUNIZATION REQUIREMENTS
North Carolina state law requires all students entering a college in the state to meet the immunization requirements specified below. A family physician or the Health Department must verify that the student has the necessary immunizations. UNC Charlotte's Report of Medical History form, provided by the Office of Undergraduate Admissions or available at http://www.uncc.edu/health_svcs, may be used for this purpose.

Students who do not have a complete immunization record on file when beginning classes will have 30 days to obtain the required immunizations. A campus clinic will be available. Students who are not in compliance with these requirements within 30 days of the first day of class will be required to withdraw from classes.

The following students are exempt from these requirements:
1) Students who attend classes only in the evening (i.e., after 3:30 p.m.);
2) Students who attend classes off campus only;
3) Students who enroll in no more than four hours per semester; and
4) Students taking weekend classes only.

Medical and religious exemptions can be requested through the Health Center. Questions and forms should be directed to: UNC Charlotte Student Health Service, Charlotte, NC 28223.

Required Immunizations
A. For students 17 years of age and younger.
   3 DTP (Diphtheria, Tetanus, Pertussis) or 3 Td (Tetanus-diphtheria) doses; 1 Td dose must be within the last ten years.
   3 Polio (oral) doses.
2* MEASLES (Rubella) doses on or after the first birthday.
1** RUBELLA dose on or after first birthday.
1** MUMPS dose on or after first birthday.

B. For students born after December 31, 1956, to 18 years of age.
3 DTP or 3 Td doses; one Td dose must be within the last ten years.
2* MEASLES (Rubella) doses on or after the first birthday.
1** RUBELLA dose on or after first birthday.
1** MUMPS dose on or after first birthday.

C. For students born prior to January 1, 1957, through age 49.
Primary series of 3 DTP or 3 Td doses - one dose must be within the last ten years.
A documented Td BOOSTER within the past ten years will be accepted as evidence of the initial series.
1** RUBELLA dose.

D. For students 50 years of age and older.
Primary series of 3 DTP or 3 Td doses - one dose must be within the last ten years.
A documented Td BOOSTER within the past ten years will be accepted as evidence of the initial series.

E. For all International Students
Tuberculin Skin Test (PPD) within the 12 months preceding classes.
Chest x-ray if test is positive.

* History of physician-diagnosed measles disease OR laboratory proof of immunity is acceptable. Must repeat measles vaccine if received even one day prior to first birthday.
** ONLY laboratory proof of immunity to rubella or mumps is acceptable; physician-diagnosed rubella or mumps disease is not acceptable.
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New Position, July 1, 2002  
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