



# **UIC** Graduate College Catalog

2000-2002

UNIVERSITY OF  
ILLINOIS AT CHICAGO



Information: (312) 996-3000

This publication is a record of the 2002–2004 academic years. It is for informational purposes only and does not constitute a contract. The information was current at the time of publication. Faculty assignments and programs listed are subject to change, and individual departments and units should be consulted for further information. Courses listed in this publication are subject to revision without advance notice. Courses are not necessarily offered each term or each year. Individual departments or units should be consulted for information regarding regularity of course offerings.

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## A Message from the Dean

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The Graduate College at the University of Illinois at Chicago is dedicated to a simple idea: bringing together superb students with outstanding research faculty in a diverse and stimulating urban environment.

There has never been a more exciting time to pursue advanced study. New fields of learning and new approaches in traditional fields are providing today's graduate students with the ideas, skills, and disciplines to shape the world around them. UIC's 5,000 graduate students are enrolled in nearly fifty PhD programs and over eighty masters programs, spanning the range of arts and humanities, social sciences, life sciences, physical sciences, and engineering.

Nationally ranked programs, award-winning faculty, and one of the most diverse graduate student bodies in the nation are among the advantages UIC has to offer, all within the heart of metropolitan Chicago. UIC may justly claim to be a model for the research universities of the next century. I invite you to make it your home.

Clark Hulse  
Dean of the Graduate College

# Academic Calendar

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## Fall Semester (2002)

August 26, M.....Instruction begins.  
September 2, M.....Labor Day holiday. No classes.  
September 6, F.....Last day to complete late registration and last day to add a course. Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
September 27, F.....Last day to file for graduation this term.  
October 4, F.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
November 1, F.....Last day to submit approved thesis/dissertation for graduation this term.  
November 22, F.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.  
November 28-29, Th-F.....Thanksgiving holiday. No classes.  
December 6, F.....Instruction ends.  
December 9-13, M-F.....Final examinations.  
December 14, Sa.....Semester ends.

## Spring Semester (2003)

January 13, M.....Instruction begins.  
January 20, M.....Martin Luther King Jr. holiday. No classes.  
January 24, F.....Last day to complete registration and last day to add a course. Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
February 14, F.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
Last day to file for graduation this term.  
March 17-21, M-F.....Spring vacation. No classes.  
March 21, F.....Last day to submit approved thesis/dissertation for graduation this term.  
April 18, F.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.  
May 2, F.....Instruction ends.  
May 5-9, M-F.....Final examinations.  
May 10, Sa.....Semester ends.  
May 11, Su.....Commencement.

## Summer Session (2003)

May 26, M.....Memorial Day holiday. No classes.  
June 2, M.....Instruction begins.  
June 13, F.....Last day to complete registration and last day to add a course(s). Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
June 27, F.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.  
Last day to file for graduation this term.  
July 4, F.....Independence Day holiday. No classes.  
July 11, F.....Last day to submit approved thesis/dissertation for graduation this term.  
July 18, F.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.  
July 23, W.....Instruction ends.  
July 24-25, Th-F.....Final examinations.  
July 26, Sa.....Session ends.

### **Fall Semester (2003)**

August 25, M	.....Instruction begins.
September 1, M	.....Labor Day Holiday. No classes.
September 5, F	.....Last day to complete registration and last day to add a course. Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.
September 26, F	.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences. Last day to file for graduation this term.
October 31, F	.....Last day to submit approved thesis/dissertation for graduation this term.
November 21, F	.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
November 27-28, Th-F	.....Thanksgiving holiday. No classes.
December 5, F	.....Instruction ends.
December 8-12, M-F	.....Final examinations.
December 13, Sa	.....Semester ends.

### **Spring Semester (2004)**

January 12, M	.....Instruction begins.
January 19, M	.....Martin Luther King Jr. holiday. No classes.
January 23, F	.....Last day to complete late registration and last day to add a course(s). Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences
February 6, F	.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences. Last day to file for graduation this term.
March 19, F	.....Last day to submit approved thesis/dissertation for graduation this term.
March 22-26, M-F	.....Spring vacation. No classes.
April 16, F	.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
April 30, F	.....Instruction ends.
May 3-7, M-F	.....Final examinations.
May 8, Sa	.....Semester Ends.
May 9, Su	.....Commencement.

### **Summer Session (2004) (Calendar subject to change)**

May 31, M	.....Memorial Day. No classes.
June 1, Tu	.....Instruction begins.
June 11, F	.....Last day to complete late registration and last day to add a course(s). Last day to drop a course(s) offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.
July 5, M	.....Independence Day holiday. No classes.
July 9, F	.....Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences. Last day to file for graduation this term.
July 9, F	.....Last day to submit approved thesis/dissertation for graduation this term.
July 23, F	.....Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
July 28, W	.....Instruction ends.
July 29-30, Th-F	.....Final examinations.
July 31, Sa	.....Summer session ends.

Note: This calendar is subject to change. Check the current UIC Timetable for accurate dates and deadlines.

## **Board of Trustees of the University of Illinois**

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Robin Hambleton

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Nancy John

## **Executive Director, Admissions and Records**

Rob Sheinkopf

## **Focus Statement**

Located in the nation's third largest metropolitan area, the University of Illinois at Chicago (UIC) offers instruction at the baccalaureate, master's, first professional, and doctoral levels. The university conducts research and public service in a variety of fields and ranks among the top universities nationally in attracting external support for these activities. A significant portion of the student body commutes, is older than traditional college age, attends part-time, and has transferred from other institutions. In addition to pursuing statewide goals and priorities, the University of Illinois at Chicago:

- strengthens the economic and social vitality of the Chicago metropolitan area through its urban land grant mission, which emphasizes business and industrial development, health care, school improvement, and enhanced opportunities for minority groups;
- offers instruction, research, and public service in traditional fields such as engineering and the arts and sciences complemented and enhanced by a focus of health and medical sciences and services;
- provides off-campus programs in community college districts in the Chicago metropolitan area; and
- has a statewide mission to provide off-campus programs in health sciences and in selected other areas not generally available through other colleges and universities in the state.

## **Accreditation**

The University of Illinois at Chicago is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools (NCA). The NCA is recognized by the Commission on Recognition of Postsecondary Accreditation. In 1997, NCA voted to continue accreditation of UIC for the maximum period of 10 years. The next comprehensive evaluation of UIC is scheduled for 2006–2007. Verification of accreditation status is available through the Office of the Chancellor at (312) 413-3350.

In addition to institutional accreditation, individual programs are accredited by such organizations as the Accreditation Board for Engineering and Technology, the American Assembly of Collegiate Schools of Business, the American Chemical Society, the American Corrective Therapy Association, the American Council on Pharmaceutical Education, the American Dietetic Association, the American Physical Therapy Association, the American Planning Association, the American Psychological Association, the American Society of Clinical Pathologists, the Committee on Allied Health Education Accreditation, the Council on Education for Public Health, the Council on Social Work Education, the Illinois Office of Education, the Liaison Committee on Medical Education of the American Association of Medical Colleges and the American Medical Society, the National Architectural Accrediting Board, the National Association of Schools of Art and Design, the National Association of Social Workers, the National Athletic Trainers Association, and the National League for Nursing.



## Services

Office	Location	Phone
Admissions	1100 Student Services Building	(312) 996-4350
Bookstore (East side)	118 Chicago Circle Center	(312) 413-5500
Bookstore (West side)	CL8 Chicago Illini Union	(312) 413-5550
Career Service	3050 Student Services Building	(312) 996-2300
Children's Center (East side)	287 Roosevelt Road Building	(312) 413-5330
Children's Center (West side)	114 Applied Health Sciences	(312) 413-5325
Counseling Center	2010 Student Services Building	(312) 996-3490
Disability Services (Student)	1190 Student Services Building	(312) 413-2183
Family Medicine Center	1801 West Taylor Street, 4th Floor North	(312) 996-2901
Financial Aid	1800 Student Services Building	(312) 996-3126
Graduate College	606 University Hall	(312) 413-2550
Graduate Student Council	230 Chicago Illini Union	(312) 996-9228
Housing Services	317 Student Residence Hall	(312) 355-6300
Identification Card (East side)	1790 Student Services Building	(312) 413-5940
Identification Card (West side)	242 Chicago Illini Union	(312) 413-5944
International Services	2160 Student Services Building	(312) 996-3121
Library of the Health Sciences	1750 West Polk Street	(312) 413-0403
Parking (three offices)	2620 Student Services Building	(312) 413-9020
	217 Student Residence Hall	(312) 413-5850
	118 Wood Street Parking Structure (Main)	(312) 413-5800
Records and Registration	1200 Student Services Building	(312) 996-4350
Research Services, Office of	304 Administrative Office Building	(312) 996-2862
Speech Language Hearing Clinic	2075 Student Services Building	(312) 996-3132
Student Accounts Receivable	1900 Student Services Building	(312) 413-2842
Student Development Services	1600 Student Services Building	(312) 996-3100
Student Information Network Center	1090 Student Services Building	(312) 996-5000
Student Ombudsperson	2080 Student Services Building	(312) 996-8145
Testing Service	1070 Student Services Building	(312) 996-0919
Travel	200C Chicago Circle Center	(312) 996-4488
Travel	1A Chicago Illini Union	(312) 996-4705
University Health Services	E144 Medical Sciences Building	(312) 996-7420
University Library	801 South Morgan Street	(312) 996-2726

### Centers, Institutes, and Laboratories

Biologic Resources Laboratory	101 Biologic Resources Laboratory	(312) 996-7040
Computer Center	2267 Science and Engineering Laboratories	(312) 413-0003
Disability and Human Development, Institute on	436 Ill. Inst. for Developmental Disabilities	(312) 413-1647
Electronic Visualization Laboratory	2036 Engineering Research Facility	(312) 996-3002
Energy Resources Center	1227 Science and Engineering Offices	(312) 996-4490
Great Cities Institute	400 College of Urb. Plan. & Publ. Affairs Hall	(312) 996-8700
Institute for the Humanities	Basement, Stevenson Hall	(312) 996-6354
Midwest AIDS Training & Education Center	173 College of Medicine East Tower	(312) 996-1373
Research Resources Center	E102 Medical Sciences Building	(312) 996-7600
Social Science Data Archives	B111 Behavioral Sciences Building	(312) 996-7742
Social Science Research, Office of	B111 Behavioral Sciences Building	(312) 996-6439
Survey Research Laboratory	615 Alumni Hall South	(312) 996-5300
Urban Economic Development, Center for	2100 Alumni Hall	(312) 996-6336

### Professional Degree Programs

In addition to the graduate degree programs listed in this catalog, UIC offers a number of professional degree programs that are not part of the Graduate College. Students interested in these programs should contact the college/school directly for information.

Master of Business Administration (MBA)	College of Business Administration	(312) 996-4573
Doctor of Dental Sciences (DDS)	College of Dentistry	(312) 996-1020
Master of Engineering (MEngr)	College of Engineering	(312) 996-9806
Doctor of Medicine (MD)	College of Medicine	(312) 996-5635
Master of Public Health (MPH)	School of Public Health	(312) 996-6625
Doctor of Public Health (DrPH)	School of Public Health	(312) 996-6625
Master of Social Work (MSW)	Jane Addams College of Social Work	(312) 996-3218

## Graduate College

**Room 606 University Hall (MC 192)**  
**601 South Morgan Street**  
**Chicago, Illinois 60607-7106**

**Phone (312) 413-2550**

**Fax (312) 413-0185**

**E-mail [gradcoll@uic.edu](mailto:gradcoll@uic.edu)**

**Home Page <http://www.uic.edu/depts/grad/>**

**Dean of the Graduate College: Clark Hulse**

**Associate Deans: Amy Levant and Mrinalini Rao**

**Assistant Deans: Steven Kragon, Katrina Myers Caldwell, and José Perales**

The Graduate College of the University of Illinois at Chicago is made up of selected faculty members from various colleges in the university. In conjunction with their line colleges and under the guidelines of the Graduate College, these faculty members offer advanced academic and research programs for highly qualified postbaccalaureate students. All students admitted to a master's program [except the Master of Business Administration, the Master of Engineering (professional, MEng), the Master of Public Health, or the Master of Social Work programs] or in a doctor of philosophy or doctor of arts program at UIC are enrolled in the Graduate College.

### Master's Degrees

Ten types of master's degrees are offered through the Graduate College at UIC: the Master of Architecture, the Master of Arts, the Master of Education, the Master of Fine Arts, the Master of Health Professions Education, the Master of Public Administration, the Master of Science, the Master of Arts or Science in Teaching (History and Mathematics), and the Master of Urban Planning and Policy.

The university also offers master's degrees in business administration, engineering (professional), public health, and social work. Information on these programs is available through the College of Business, the College of Engineering, the School of Public Health, and the Jane Addams College of Social Work.

### Doctoral Degrees

The *Doctor of Philosophy* at UIC places traditional emphasis on the advancement of knowledge through independent research in the candidate's chosen field and the presentation of an original thesis. The degree is intended primarily for those who need the highest level of research training and who wish to pursue careers in colleges and universities, research institutes, and public agencies or industrial and business organizations.

The *Doctor of Arts* is a professional degree for college teachers and instructional designers. It combines the rigor and high level of scholarship in the subject matter of the Doctor of Philosophy with the acquisition of special skills in modern instructional methods. The program is designed to provide training through special courses and thesis research in such areas as curriculum design, teaching methodology, the creation of instructional materials, computer-assisted instruction, and educational evaluation. The Doctor of Arts is offered in the Departments of Biological Sciences and Mathematics.

The *Doctor of Public Health* is offered through the School of Public Health.

### Joint Degree Programs

UIC offers students the opportunity to pursue more than one graduate degree at the same time through one of our approved joint degree programs. Approved joint degree programs share a certain number of courses that are applied to both degrees. Joint degree programs currently available through the Graduate College are the MBA/MS (accounting); MBA/MA (economics); MBA/MS (MIS); MBA/MS (nursing); MPH/MS (nursing); and MD/PhD. The university also offers a joint MBA/MPH program that is not part of the Graduate College.

### Directors of Graduate Studies

Each graduate program has a director of graduate studies who is responsible for overseeing program development, evaluating applications for admission to the Graduate College, advising graduate students, and evaluating student progress. The director of graduate studies is listed at the beginning of each program entry in this catalog.

### Academic Year

The academic year at UIC consists of two sixteen-week semesters (including the final examination periods) that begin in August (fall semester) and January (spring semester), with an eight-week summer session that begins in June. In most programs, a student may seek admission to any academic term; however, the scheduling in many programs makes it desirable or necessary that students enter in the fall term.

### Campus Hours

Hours of instruction at UIC begin at 8:00 a.m. Many programs offer classes in the late afternoon and evening. Administrative offices are open between 8:30 a.m. and 4:45 p.m., Monday through Friday.

### Admissions

Applicants are considered on an individual basis. Admission decisions are made in compliance with the University of Illinois nondiscrimination policy printed in the "University Regulations" section of this catalog.

Prospective students should consult the appropriate section(s) of this catalog for the specific admission requirements of each program.

### Degree Admission

Degree admissions are classified as either full or limited status. Students admitted on limited standing are those admitted on a provisional basis. Requirements for limited standing admission must be approved and supported by the Graduate College. The Graduate College with the advice of the graduate department sets the conditions for limited standing.

### Full Status

The Graduate College minimum requirements for full status degree admission are as follows:

*Prior Degrees:* Except for seniors at UIC (see Graduate Study by Undergraduate Seniors), a baccalaureate or its equivalent from an accredited college or university.

*Transcripts:* Required from all institutions where the applicant earned the last 60 semester (90 quarter) hours of credit toward the baccalaureate degree and from all institutions where postbaccalaureate work has been done.

*Grade Point Average:* At least 2.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, including all of the work taken in the quarter or semester in which the student began the final 60 semester hours of undergraduate study. The cumulative grade point average obtained in all work completed beyond the baccalaureate will also be computed and considered in the admissions decision.

*Tests Required:* Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). The test score cannot be more than two years old. A minimum score of 550 (paper-based) or 213 (computer-based) is required by the Graduate College; many departments have a higher minimum. UIC's Institutional Code is 1851. No other tests are required by the Graduate College.

*Letters of Recommendation:* Not required by the Graduate College.

*Personal Statement:* Not required by the Graduate College.

*Other Requirements:* Recommendation for admission by the graduate program to which application is made and by the Dean of the Graduate College.

***The above requirements are the minimum Graduate College requirements for admission as a degree student; most programs have additional requirements. Consult the appropriate section(s) of this catalog for the specific admission requirements of each program.***

### **Limited Status**

Limited status is a probationary status for degree students who have not met all of the admission requirements, such as those who: have less than a 2.75 undergraduate grade point average; have specified course deficiencies to be removed; must submit additional credentials required by the program (such as letters of recommendation or admissions test scores); or are UIC seniors within eight semester hours of earning the baccalaureate at the time of matriculation. A department can recommend that a student be admitted on limited status to the Graduate College. The Graduate College makes the final decision.

For applicants to be admitted to limited status the graduate program will recommend to the Graduate College specific conditions for admission. Graduate College approval is required for admission of limited-status students. Students can be admitted on limited status for no more than two semesters (including summer) or 16 semester hours, whichever occurs earlier. Graduate programs may specify shorter time limits. If the conditions are not met within the time limit, the program will notify the Graduate College, and the student will be dismissed from the Graduate College.

### **Graduate Study by UIC Undergraduate Seniors**

With the approval of the graduate program, the undergraduate or professional college, and the Graduate College, UIC students in their last year of study for an undergraduate degree may be admitted to the Graduate College if they are within eight semester hours of earning the baccalaureate at the time of matriculation. These students will be admitted on limited status for no more than two terms in residence, pending completion of the baccalaureate. Courses used to fulfill undergraduate degree requirements cannot be applied to a graduate degree.

Applicants who are admitted to limited status pending completion of their bachelor's degree must be awarded the undergraduate degree within two terms in residence. If this condition is not satisfied, graduate admission is cancelled and the student is transferred back to the undergraduate college.

### **Application Procedures**

Application forms are available from the graduate program offices, the Graduate College and the Graduate College Web site (includes on-line application). Applications and supporting credentials should be submitted as early as possible. Applications received after the deadline will be returned to the applicant. Some graduate programs have application deadlines that are earlier than the university deadline, and some admit students in the fall semester only. Prospective applicants should contact the program of interest for information on current deadlines.

The following credentials, if required by the program, should be sent directly to the graduate program office:

- Letters of recommendation
- Personal statements
- Portfolios
- Proof of licensing or certification
- Any other credentials required by the program

Admission recommendations cannot be made until all required documents have been received.

### **Domestic Applicants**

Applicants to programs other than the professional degree programs [business administration (MBA), engineering (MEng), public health (MPH, DrPH), and social work (MSW)] should submit the following materials directly to the Graduate Admissions division of the Office of Admissions and Records:

- Graduate College Application, completely filled out and signed.
- Nonrefundable application fee of \$40. This fee is waived for applicants seeking readmission who have been previously enrolled at UIC as a graduate student and employees of UIC.
- Official transcripts, which must be sent directly from the issuing school to UIC's Office of Admissions and Records.
- Test scores, which must be sent directly from the testing service to UIC. (UIC's Institutional Code is R1851)

Applicants to the social work program should submit the above materials directly to the program, which will forward them to the Office of Admissions and Records .

### **International Applicants**

Applicants to programs other than the DrPh, MBA, MEng, MPH, or MSW programs should submit the following materials directly to the Graduate Admissions division of the Office of Admissions and Records:

- Graduate College Application, completely filled out and signed.
- Nonrefundable application fee of \$50 (U.S. currency). This fee is waived for applicants seeking readmission who have been previously enrolled at UIC as a graduate student and employees of UIC.
- Official transcripts must be sent directly from the issuing school to UIC's Office of Admissions and Records.
- TOEFL and other test scores must be sent directly from the testing service to UIC. (Institutional Code for TOEFL is 1851; for GRE is R1851)
- Declaration and Certification of Finances form (available on the Graduate College Web site).

Applicants to the MSW (social work) program should submit the above materials directly to the program, which will forward them to the Office of Admissions and Records .

### **Postsecondary Credentials**

Applicants who have completed studies outside the United States must present all postsecondary school credentials. Such credentials must include a record of all studies completed to date; grades or examination results received (including failing as well as passing grades); maximum and minimum grades obtainable; rank in class; degrees, diplomas, and certificates earned; and length of the school year. Documents must be authentic, and those not written in English must be accompanied by certified English translations. Copies are acceptable when certified as authentic by the issuing institution. All documents should be sent directly to UIC by the issuing institution.

### **Test of English as a Foreign Language**

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) within two years prior to admission. This test is administered by the Educational Testing Service, Box 899, Princeton, New Jersey

08540. The minimum TOEFL score accepted by the Graduate College is 550 (paper-based) or 213 (computer-based). UIC's Institutional Code is 1851. Many departments have higher minimums. Consult the department listing for details.

The TOEFL is given at regularly scheduled intervals at testing centers throughout the world. Information on testing dates, locations, and the testing fee may be obtained at American embassies and consulate offices of the U.S. Educational Foundation (also consult <http://www.ets.org>). The TOEFL examination is not required for students who have completed at least two academic years of full-time study in a country where English is the native language and in a school where English is the language of instruction within five years of the proposed date of enrollment in the university.

#### **Visa Certification**

International students granted admission receive from the Office of Admissions and Records all appropriate documents, including the certification forms that are required when applying for visas to enter the United States.

#### **Financial Arrangements**

International students must be able to finance themselves fully, including room and board, tuition, books, other expenses, and travel to and from the United States. Only a limited number of assistantships are available, so applicants should not plan on any financial assistance from UIC unless they receive a written offer of aid from a department.

All international applicants who plan to finance the cost of attending UIC from personal resources must certify that they will have available sufficient funds to cover their academic and living expenses for the academic year, plus living expenses for a summer. The exact amount required is set each year by the University of Illinois Board of Trustees. The amount is subject to change depending on tuition and room/board changes. The appropriate certification form can be obtained from the Office of Admissions and Records or the Graduate College Web site. Applicants who are unable to provide satisfactory evidence of adequate finances or who have not sent a notarized certified statement verifying funds available and their source will not be granted admission. Official admission letters and visa documents cannot be sent until certification is received.

International students may apply for fellowships, assistantships, and tuition waivers. These financial aids are awarded on the basis of outstanding scholarship and potential to undertake research. Contact the director of graduate studies of the program of interest for more information.

#### **Oral English Proficiency of Teaching Assistants**

Illinois state law requires that the university attest to the English proficiency of all classroom instructors, including teaching assistants. Teaching assistants who are not native speakers of English (regardless of their citizenship status) must have their oral English proficiency assessed by the appointing department. The method of assessing English proficiency is at the discretion of the appointing unit and may include standardized tests and/or interviews. The department head of the hiring unit must certify in writing that the student has sufficient oral English proficiency to provide classroom instruction before the student's appointment papers will be processed.

#### **Nondegree Admission**

Nondegree status is designed for two types of applicants who hold the baccalaureate:

- Individuals who do not wish to pursue a degree but want to take courses for professional or scholarly reasons or personal enrichment.
- Individuals who have been out of school for several years or in a different field of study and wish to take a few courses before deciding whether to apply for a

degree program.

The Graduate College minimum requirements for nondegree admission are as follows:

*Prior Degrees:* A baccalaureate or its equivalent from an accredited college or university. Nondegree applicants must submit proof of the degree with their application.

*Transcripts:* Not required by the Graduate College.

*Tests Required:* Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). The test score cannot be more than two years old. A minimum score of 550 (paper-based) or 213 (computer-based) is required by the Graduate College; many departments have a higher minimum. UIC's Institutional Code is 1851. No other tests are required by the Graduate College.

*Other Requirements:* International students who require certification of admission (I-20 or IAP-66) sent to the Immigration and Naturalization Service will not be admitted as nondegree students.

Some programs require additional credentials for nondegree admission, and some programs do not admit nondegree students. Applicants can be admitted as nondegree but remain ineligible to register for certain classes. It is the responsibility of the applicant to contact the program offering specific courses to determine their eligibility to enroll.

#### **Changing from Nondegree to Degree**

Nondegree graduate students interested in changing to degree status must submit a Graduate College Application. All application credentials must be on file before the change to degree status will be considered. The form and all credentials must be submitted by the degree application deadline.

No more than 12 semester hours of credit earned as a nondegree student can be transferred into the degree program. Students must file a petition for the transfer of nondegree credit; only graduate-level courses in which a grade of A or B was earned will be considered. (See Transfer Credit)

***Admission to nondegree status does not obligate the Graduate College or any graduate program to later admit a student to a degree program.***

#### **Changing Academic Programs/Adding a Second Program**

Currently enrolled graduate students who wish to change to or add another degree program, or change between master's and doctoral levels within a program, must submit a completed *Request for Change of Graduate Program* form to the Graduate College at least two weeks prior to the term for which the change is requested, although some programs may have an earlier deadline. This form is also used to add a second degree program. This form must be signed by both the old and new departments, and for international students on a J-1 visa, the Office of International Services. Students should meet with the director of graduate studies of the new program to discuss departmental procedures, deadlines, and credentials required. A *Petition for Transfer Credit* listing all previously completed courses accepted by the new department should be attached to the *Request for Change* form.

Students must also use the *Request for Change of Graduate Program* form to transfer within the Graduate College or between the Graduate College and the MBA Program, the Master of Engineering (professional) Program, the School of Public Health, or the Master of Social Work Program. Complete instructions and deadlines are detailed on the back of the form. The form is available from your program office, the Graduate College office, or the Graduate College Web site.



## Financial Aid

The University of Illinois at Chicago offers six basic types of financial aid for graduate students: fellowships, assistantships, tuition and service fee waivers, traineeships, loans, and employment. Applicants for these types of aid must be admitted to a graduate degree program or have a completed application pending. Eligibility for loans is determined by the Office of Student Financial Aid. Eligibility for employment is determined by the Office of Human Resources. Applicants for loans and employment should go directly to these offices. Applications for fellowships, assistantships, and tuition/fee waivers are available in your department office, the Graduate College office, and the Graduate College Web site. In the administration of these programs and in selecting students for participation in them, the University of Illinois at Chicago adheres to the policy of nondiscrimination printed in the "University Regulations" section of this catalog.

## Fellowships

Fellowship stipends are awarded in recognition of scholarly achievement and promise. They enable students to pursue graduate studies and research without a service requirement. The stipends of different fellowships vary. Unless explicitly stated otherwise, all fellows supported by the Graduate College (i.e. University Fellowships, Abraham Lincoln, Diversity, IMGIP, ICEOP) are exempt from tuition and the service fee. Fellows may engage in paid employment only to the extent permitted by the award and approved in writing by the dean of the Graduate College.

### University Fellowships

University Fellowships are awarded to outstanding students on the basis of an all-campus competition.

*Amount:* Fellows receive an annual stipend of \$15,000 and a tuition and service fee waiver.

*Eligibility:* These awards depend primarily on the academic promise and scholarly achievement of the applicant and are not restricted to any particular field of graduate study. Both master's- and doctoral-level graduate students are eligible to apply. If required by the academic program, standardized test (e.g., GRE) scores should be included. Two competitions for university fellowships are held each year. The first is limited to students who have been admitted to a graduate program at UIC but have not yet enrolled. The second competition is open to both continuing students and prematriculants. University fellows can accept partial assistantships as determined by the Graduate College and their department.

*Application Procedures:* Students apply directly to their department, which selects from among the applicants those it wishes to nominate for consideration by the Graduate College Awards Committee, which makes the final recommendation to the dean. Contact the Graduate College for information on the current deadlines for University Fellowship applications.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve month appointments require summer registration.

### Graduate College Diversity Fellowships

The goal of the Graduate College's Diversity Fellowship Program is to increase diversity in the student body by providing start-up matching funds.

*Amount:* Students enrolled in PhD programs receive an annual stipend of \$15,000 and a tuition and service fee waiver from the Graduate College for the first and fourth year of fellowship. The academic program must provide financial support for years two and three of the fellowship at the same level of support as typically paid in the department (this support may come in the form of a teaching or research assistantship). Students enrolled in the MFA program only receive one year of funding from the Graduate College. If

funds are available, continuing students may apply; however, continuing students will only be funded for one (1) year.

*Eligibility:* First-year students from traditionally underrepresented racial and ethnic minority groups (African American, Hispanic, or Native American) who have not yet begun graduate work at UIC are eligible. Applicants must be admitted to a PhD or MFA program at UIC. MFA students are eligible to reapply for a second year competition. Applicants must also be a citizen or permanent resident of the United States. Continuing students might be eligible if funds are still available.

*Application Procedures:* Applicants should submit an Application for Graduate Appointment to their academic program. The academic program forwards the completed nomination packages to the Graduate College for review and recommendation to the Dean.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve month appointments require summer registration.

### Dean's Scholar Award

The Dean's Scholar Award is presented by the dean of the Graduate College in recognition of a student's scholarly achievement. It is intended to provide highly qualified, advanced-level graduate students with an opportunity to devote themselves to a period of intensive research without ongoing teaching obligations.

*Amount:* Dean's scholars receive a one-year stipend of \$15,000, a tuition and service fee waiver, and a research expenditure award of \$1,000. (Note: Some colleges have an additional tuition differential that may not be waived. Check with your home department/DGS for details.) They are *not* renewable.

*Eligibility:* Doctoral candidates only. Students must have passed their preliminary examination and have a plan approved by their department for their dissertation research. Dean's scholars may not accept a teaching assistantship but may accept a research assistantship for not more than fifty percent time in his/her research field.

*Application Procedures:* Each doctoral program may nominate one student only for the award. The nominations are reviewed by the Graduate College Awards Committee, which makes the final recommendation to the dean.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve-month appointments require summer registration.

### Abraham Lincoln Graduate Fellowships

This program is designed to expand the overall breadth of background of the UIC graduate student body by providing support to individuals from racial and ethnic minority groups that have been traditionally underrepresented in graduate education.

*Amount:* An annual stipend of \$15,000 and a tuition and service fee waiver. (Note: Some colleges have an additional tuition differential that may not be waived. Check with your home department/DGS for details.) Abraham Lincoln fellows can accept partial assistantships as determined by the Graduate College and their department.

*Eligibility:* Applicants must be citizens or permanent residents of the United States from one of the racial and ethnic minority groups traditionally underrepresented in graduate education, specifically Native American, African-American, Mexican-American, and Puerto Rican students.

*Application Procedures:* Students apply directly to their graduate program. The academic programs will forward their completed application packages for consideration by the Graduate College Awards Committee, which makes the final recommendation to the dean.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve-month appointments require summer registration.

### **Illinois Consortium for Educational Opportunity Program**

The Illinois Consortium for Educational Opportunity Program (ICEOP) was established by the Illinois General Assembly to provide financial assistance to members of traditionally underrepresented racial minority groups to pursue and complete graduate or professional degrees at Illinois institutions of higher education.

*Amount:* \$12,500 stipend for a 12 month appointment and a tuition and service fee waiver. (Note: Some colleges have an additional tuition differential that may not be waived. Check with your department/DGS for details.) The award is renewable for one year for master's students and for three additional years for doctoral candidates, contingent on the recipient making satisfactory academic progress toward completion of the degree.

*Eligibility:* Students from traditionally underrepresented racial/ethnic minority groups (i.e., Native American, African-American, Mexican-American, and Puerto Rican graduate students) are eligible for this award. Students must be Illinois residents to apply. Award recipients must agree to accept teaching or administrative employment at an Illinois postsecondary institution or with an Illinois higher education governing or coordinating board, or the students may be required to pay back a portion of the award.

*Application Procedures:* ICEOP applications must be submitted to the student's academic program in early February.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve-month appointments require summer registration.

### **Illinois Minority Graduate Incentive Program**

The Illinois Minority Graduate Incentive Program (IMGIP) is an effort of major doctoral degree-granting institutions in the state of Illinois to increase both the current minority doctoral student enrollments and the subsequent contributions of these groups as faculty members, specifically in the fields of the physical sciences, life sciences, and engineering where members of Native American, African-American, Mexican-American, and Puerto Rican descent have been traditionally underrepresented.

*Amount:* In addition to a tuition and service fee waiver, each fellow will receive an annual stipend of \$17,500 and an annual allowance of \$1,500 for books, supplies, equipment, and travel for a maximum of three years. (Note: Some colleges have an additional tuition differential that may not be waived. Check with your home department/DGS for details.)

*Eligibility:* Native American, African-American, Mexican-American, and Puerto Rican students in physical sciences, life sciences, or engineering. Applicants must be citizens or permanent residents of the United States.

*Application Procedures:* IMGIP application forms must be submitted to the student's academic program in February.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve-month appointments require summer registration.

### **Martin Luther King, Jr., Financial Award**

*Amount:* The Martin Luther King, Jr., Financial Award (\$5,000) is dispersed by the Office of Student Financial Aid in two equal payments during the fall and spring semesters.

*Eligibility:* African-American, Hispanic-American, or Native American students at UIC who will be enrolled in UIC graduate fields of study where minorities have been historically underrepresented. Applicants must be U. S. citizens or permanent residents and plan to be enrolled full-time as graduate students in degree programs at UIC during the entire academic year. Present and past holders of graduate and professional King scholarships are not eligible.

*Application Procedures:* Applications are submitted to the Office of the Vice Chancellor for Student Affairs.

*Registration Requirements:* At least 12 hours each semester (six in summer). Twelve-month appointments require summer registration.

### **Assistantships**

The colleges, graduate programs, administrative offices, and research centers appoint graduate students as teaching, research, or graduate assistants.

*Work Schedule:* The weekly clock hours of service required of assistants are 18.75 for a half-time appointment and the proportional fraction of time for other appointments.

*Stipend:* The stipend for an appointment of 50 percent time for the nine-month academic year is at least \$10,500; most departments offer a greater amount. This amount may change without notice.

*Waivers:* Tuition and the service fee are waived for assistants if the appointment is between 25 and 67 percent for at least three-quarters of the term (91 calendar days in fall or spring semester, 41 calendar days during the summer session).

Graduate students who hold academic appointments as assistants for the spring semester and for whom tuition and service fees have been waived are entitled to a waiver for the summer term immediately following, provided they are registered for at least three hours during that summer term.

*Registration Requirements:* At least eight hours each semester. Some programs may require registration for more than eight hours per term and/or summer registration. The Graduate College does not require summer registration; however, a minimum of three hours registration is required to receive a summer tuition and service fee waiver.

### **Board of Trustees Tuition and Service Fee Waiver**

A limited number of Board of Trustees tuition and service fee waivers are available to graduate students. Students must apply for waivers through the director of graduate studies in their programs. A Board of Trustees waiver provides waiver from tuition and the service fee only; the health insurance fee and other fees are the student's responsibility.

*Registration Requirements:* At least 12 hours per semester (six in the summer term). Waiver recipients may accept part-time employment, not to exceed 20 hours a week either within or outside the university. If a student drops below 12 hours of registration at any time during the semester (or six hours in the summer term) the waiver is rescinded and the student is billed the tuition and service fee.

### **Other Sources of Financial Aid**

#### **Traineeships**

Training grants are awarded to graduate programs to support student involvement in specific activities. The grant may support students with stipends and/or tuition and service fee waivers. To be eligible, students must be admitted to a graduate degree program or have a completed application pending. Contact your director of graduate studies for information on the availability of traineeships in your program.

#### **Industrial, Endowed, and Special Fellowships**

Various industrial firms, foundations, and private individuals have generously donated funds to support a number of special fellowships for graduate students at the University of Illinois at Chicago. The stipends and supplemental allowances of these fellowships are not uniform, and most are restricted to students in particular areas of study. Contact your director of graduate studies for information on any special fellowships that may be available through your program.

### **Illinois Veterans Scholarship**

The Illinois Veterans Scholarship covers the admissions application fee, tuition, and a small varying portion of the service fee. Contact the Office of Student Financial Aid, Suite 1800, 1200 West Harrison Street, (312) 996-3126, for more information and applications. Please bring a copy of your DD-214 when you apply.

### **University Administered Loans and Work Study**

UIC's Office of Student Financial Aid (OSFA) awards and coordinates assistance from a variety of federal and state financial aid programs. Graduate students are eligible for Perkins Loans, Stafford Student Loans, Loans for Parents, Supplemental Loans for Students, and College Work Study.

Applicants for financial aid awarded through the OSFA must be U.S. citizens or permanent residents and must have applied for admission to a degree-granting program of the university. To receive assistance, students must be admitted to and enrolled in a degree-granting program.

The OSFA maintains a listing of outside sources of financial aid in the Reference Section of the UIC Library.

### **Enrollment**

Graduate students are governed by the policies of the University of Illinois at Chicago, the Graduate College, their line college, and their department, and they are expected to become familiar with these policies. The Graduate College Catalog in effect when the student begins enrollment in a degree program is the primary source of information on Graduate College policies pertaining to the student. Many of the university and departmental policies are listed in this catalog, and most programs have policy manuals for graduate students. When a department requirement is approved by and exceeds that of the Graduate College, it replaces the Graduate College standard.

### **Adding and Dropping Courses**

Students may not add a course after the tenth day of instruction in a semester or the fifth day of instruction in the summer session.

Graduate students must follow the drop policy of the college offering the course. The Colleges of Business Administration, Engineering, and LAS drop deadline is the second week of the semester; courses offered through remaining colleges have a deadline of the sixth week of the semester. No refund of tuition will be issued for a drop after the tenth day of instruction (fifth day in summer) regardless of final deadline, unless the student withdraws from the university (see section on fees). Consult the *UIC Timetable*, published each term, for current deadlines.

Holders of fellowships, assistantships, and tuition and fee waivers must maintain the required number of credit hours or risk loss of their tuition and service fee waiver for the term. Students who lose their waivers will be billed the full cost of tuition and fees. Students on visas must maintain the registration requirements of their visa. (For clarification, contact the Office of International Services).

### **Advisors**

All graduate students must have an academic advisor in the graduate program in which degree work is to be done. The academic advisor assists in planning a program of graduate study that fits the needs of the student and satisfies the graduate program and Graduate College requirements. New students should consult the director of graduate studies to discuss the selection of an academic advisor. All PhD candidates must have a dissertation advisor who is a member of the Graduate College. Both master's and doctoral students must have a major advisor (academic or research) who is a member of the Graduate College faculty.

Unassigned nondegree students do not have a formal advisor. These students must receive approval from an authorized person in the program(s) offering the course(s) they wish to take each term prior to attempting registration.

### **CIC Traveling Scholar Program**

The CIC Traveling Scholar Program, sponsored by the Committee on Institutional Cooperation (CIC), enables doctoral students to take advantage of educational opportunities—specialized courses, unique library collections, unusual laboratories—at any of the Big Ten universities or the University of Chicago.

CIC traveling scholars should have completed at least one year of study in a doctoral program at UIC and must receive prior written approval from their advisor, their department head, and the UIC CIC liaison officer. With these approval signatures, students must then seek permission from the host institution to take the desired course(s). CIC traveling scholars register and pay for the CIC credit at UIC and also make arrangements to register at the host institution through its CIC liaison officer. A leave of absence is not required, since participants are registered at UIC during their stay at the other institution.

Since other CIC institutions have different academic calendars than UIC, participation in the CIC Traveling Scholar Program is discouraged during the student's final term before completing the degree.

Consult your director of graduate studies or the UIC CIC liaison officer in the Graduate College for more information.

### **Continuation and Probation Rules**

Graduate students are considered to be in good standing in the Graduate College if they:

- Have removed all limited status admission conditions;
- Have a minimum Graduate Degree GPA of 4.00 (see below); and
- Are making satisfactory progress toward degree requirements, including a project or thesis if required.

***Graduate programs may require a higher level of performance and may apply criteria in addition to those stated above.*** If a student fails to meet the performance or other criteria stated by the program as determined by the Graduate College the program may notify the Graduate College to initiate dismissal.

### **Limited Status**

Limited admission status students must meet the conditions imposed by this status and progress to full degree status within two semesters or any shorter amount of time set forth in the letter of acceptance. Failure to do so will result in automatic dismissal from the university.

### **Graduate Degree GPA**

The Graduate Degree GPA is the average of grades earned by graduate students in their current degree program, whether or not the courses are part of degree requirements. Only graduate-level courses in which an A, B, C, D, or E is earned are included in the Graduate Degree GPA computation. A graduate-level course is any 400- or 500-level course, plus any 300-level course taken under the quarter system. General transfer credit taken at other institutions is not computed in the Graduate Degree GPA. However, grades earned through the CIC Traveling Scholars Program are included. Grades earned as a nondegree student, or while a student in other UIC colleges or a different graduate program, will be computed if the courses are applied to the current graduate program through an approved transfer of credit petition.

### **Probation**

Academic probation is the Graduate College's mechanism for warning students that their Degree GPA has fallen below



the minimum standard of 3.00. Students have two terms of enrollment (including summer, if registered) after the term in which their Degree GPA falls below 3.00 to remove themselves from probation. Departments may enforce stricter limits on probation, provided the student is informed in writing prior to being placed on probation.

Students who leave the university while on probation, whether through formal withdrawal or through failing to meet the registration requirement, will still be on probation if they are later readmitted to the same program. Students that are admitted to a new program, begin as a new student (i.e., the Degree GPA starts over). Students currently on probation or who left the university on probation will not be admitted to the same program as nondegree students. Readmission as a degree-seeking student is not guaranteed.

Students who fail to raise their average to 3.00 or to otherwise fulfill the terms of their probation within the deadline will be dismissed from the university. The Graduate College issues probation and dismissal notices to students and their program directors. However, failure to receive notice does not change the student's probation or dismissal status, since students are expected to monitor their own progress in light of Graduate College policies.

### Course Loads

Students who can devote full-time to their studies usually enroll for 12 to 16 credit hours each term. In exceptional cases, the advisor and director of graduate studies may permit a student to enroll for up to 20 hours. Registration for more than 20 hours is not recommended. Full-time load is defined by the university as registration of 12 hours or more even if holding an assistantship.

*Fellowship Holders:* Must register for at least 12 hours of credit per semester of award (six in summer).

*Tuition-and-Service-Fee-Waiver Holders:* Must register for at least 12 hours of credit per semester of award (six in summer).

*Assistantship Holders:* Must register for at least eight hours of credit each semester, excluding summer. While summer enrollment is optional, assistants who wish to use their summer tuition and service fee waivers must register for at least three hours during that term. Some graduate programs may require registration for more than eight hours per term and/or summer registration. There are no tuition and service fee waiver benefits for students employed with less than 25 percent or more than 67 percent appointment. Assistants who qualify for a spring tuition and service fee waiver automatically receive a summer waiver if registered in at least three hours in summer unless holding a summer appointment above 67 percent.

*International Students:* For purposes of enrollment certification to the Immigration and Naturalization Service of the United States Department of Justice, the Graduate College considers foreign students to be pursuing a minimum full-time program of study if they (1) enroll for 12 or more hours of credit or (2) hold an appointment as a teaching or research assistant for (a) one-half time and enroll for at least eight hours of credit or (b) one-third time and enroll for at least 10 hours of credit.

Students on an F-1 visa may be eligible to register for zero hours if all requirements are complete except for project or thesis and a petition is submitted to the Graduate College and approved. The petition must be endorsed by the advisor and DGS or head of program and the Office of International Services.

*Veterans:* To be eligible for full benefits, veterans must register for at least 12 hours per semester (six hours in summer).

### Grades

The following grades are used:

A—4 grade points per credit hour.

B—3 grade points per credit hour.

C—2 grade points per credit hour.

D—1 grade point per credit hour (not accepted as degree credit).

E—0 grade point per credit hour (failure; not accepted as degree credit).

DF—grade temporarily deferred. Deferred grades may be used for thesis courses, continuing seminar, sequential courses, and certain courses that require extensive independent work beyond the term. At the end of the continuing course sequence the deferred grade for all terms must be converted either to a specific letter grade (A–E), to an IN (Incomplete), or to an S or U. No credit is earned until the DF grade is converted to a permanent grade.

IN—Incomplete. An incomplete grade may be given only if, for reasons beyond the student's control, required work has not been completed by the end of the term. An IN must be removed by the end of the next term in which the student is registered (including summer), or within twelve months of the end of the term in which the IN was received, whichever occurs sooner. *Course instructors may require an earlier deadline.*

An IN that is not removed by the deadline will remain on the student's record as an IN, with no credit earned (or may be replaced by a grade, at the instructor's discretion, before the Graduate College deadline to change an IN grade). A course in which an IN was received and not removed by the deadline may be repeated for credit only once.

P—Pass; F—Fail. Used only in courses taken under the pass-fail grading option. No grade points are earned and the grade is not computed in the grade point average. If the required work for the course has not been completed by the end of the term, at the instructor's discretion an IN may be given. Graduate students may take courses on a pass-fail basis provided that (1) the courses are not within their immediate area of specialization, (2) such courses account for no more than one-sixth of the total number of course hours taken at the University of Illinois at Chicago and counted toward a degree, and (3) they declare their intention to take a course on this basis at the time of registration and have the approval of their advisor and director of graduate studies. Some programs do not allow any Pass/Fail courses to be used toward degree requirements. Pass/Fail grades cannot be changed to grades A–E at a later date.

S—Satisfactory; U—Unsatisfactory. Used as grades in thesis research courses, in zero-credit courses, and in specifically approved courses. No grade points are earned, and the grade is not computed in the cumulative grade point average or the Graduate Degree Grade Point Average.

In the case of thesis research courses, instructors should assign an S or U grade to the course each term. They may assign a DF grade each term until after the thesis defense is successfully completed, the thesis committee accepts the format and content of the thesis, and the Graduate College approves the format of the thesis, but this is not recommended. In the latter case, the Graduate College will notify the registrar to change the DF grades to S. An Unsatisfactory grade can be assigned at any time when the student is not making satisfactory progress in thesis research. If this should occur, the status of the student will be reviewed by the advisor, the director of graduate studies, and the Graduate College, and the student may be dismissed from the Graduate College.

W—Withdrawn. Officially withdrawn from the course without academic penalty; no credit is earned for the course. Assigned if course is dropped after the tenth day of the semester (fifth day in summer) and before the last day of instruction for the term. This grade will remain on the



transcript but does not affect the grade point average or graduate progress index.

### **Leave of Absence**

Except for international students whose visas require continuous registration, and doctoral students who have passed their preliminary exams, graduate degree-seeking students may take one semester (fall or spring) plus the summer session off without formal leave approval from the Graduate College. Degree students who desire to take an additional consecutive semester off, for a total maximum of three consecutive terms, must file a *Graduate Petition for Leave of Absence* by the tenth day of the semester for which leave is requested.

International students who hold an F-1, J-1, A-1, A-2, or H-1 visa must register each fall and spring semester due to visa requirements. Such students must file a *Graduate Petition for Leave of Absence* for any fall or spring semester they wish to take off, obtaining written authorization on the petition from the Office of International Services. If remaining in the country, such leaves are rarely granted by that office.

Upon receipt of a leave of absence petition from the department/program, the Graduate College will automatically approve the first leave, up to one year maximum. At least one term as a graduate degree student must be completed before being eligible for a leave. After returning to the program from an approved leave, a second leave is not automatic and will only be granted by the Graduate College for medical or other extraordinary reasons.

Leave will not be granted to doctoral candidates who have passed the preliminary exam, except for students whose programs require a formal off-campus activity (e.g., internship) or for documented medical or other extraordinary reasons. If this situation occurs, a *Graduate Petition for Leave of Absence* must be submitted to the Graduate College and is not automatic.

Nondegree students are not eligible for a leave of absence.

Time spent on leave approved by the department and the Graduate College does not count towards the time to complete the degree.

Students who have already registered for the term for which leave is requested must complete either a *Cancellation of Registration* before the first day of the term, or a *University Withdrawal* by the tenth day of the semester (fifth day in summer). Students are responsible for filing the appropriate forms and resultant charges; the leave of absence petition itself does not alter existing registration.

Students who are on an approved leave of absence will not be covered by the health and personal accident insurance plan until they return to active registration.

Petition forms may be obtained from the Graduate College, 606 University Hall, or from the director of graduate studies in the graduate program.

### **Petitions**

Students may petition the dean of the Graduate College for exceptions to certain college regulations, but may do so only after consulting with their advisor and the director of graduate studies, whose recommendations must appear on the petition. Petition forms may be obtained from the Graduate College and from the graduate program office and must be accompanied by a full explanation of the circumstances and any appropriate forms and supporting documents required for processing a requested change.

***Petitions should be filed within 30 days*** from the time an individual knows, or reasonably should have known, that an occurrence has affected his or her status.

### **Registration**

Registration procedures and class offerings are published in the *UIC Timetable* each semester and graduate students are

responsible for the complete and accurate processing of their registration according to the guidelines published therein.

***Graduate students who fail to register for two terms in a row (excluding summer) without taking an approved leave of absence forfeit their admission to the Graduate College and must reapply to Graduate College and be readmitted to the program.***

Readmission is not guaranteed.

New students may register during the designated period before the beginning of their first term or during the late registration period (days one to ten for fall and spring, days one to five for summer). Currently enrolled students should register during the early registration period in the previous term. Registration information will be mailed to all currently enrolled and new students prior to registration. Continuing students who are not currently enrolled will not be sent registration information and must wait for the open registration period. Students who wait to register at late registration will be assessed a late registration fee and may experience limited course availability.

### **Registration for Zero Hours**

Registration for zero hours is only available to students who have completed all course work, examinations, and degree requirements except the thesis or dissertation. Students wishing to register for zero hours must submit a Graduate College petition and receive permission from the program and the Graduate College prior to registration. Once permission is received students may continue to register for zero hours provided they remain in the same program, continue to make satisfactory academic progress, and are within the time frame for degree completion. An option of registration for reduced zero-hour charges (Option B) exists for some doctoral students. Doctoral students who want Option B must state that on the petition, and must re-petition if needed in other terms. Master's students may be required to register for zero hours by their program or INS regulations. (*See Degree Requirements, Doctoral Degrees, and Master's Degrees*)

### **Repetition of Courses**

Students can repeat a course for credit if:

- The course is designated in the Timetable with the phrase "May be repeated for credit."
- The course is one in which a grade of D, E, F, or U was received. In such cases the course can be repeated only once and counted only once toward the degree requirements; the original grade continues to be included in the computation of the Graduate Degree GPA. The approval of both the instructor who will give the course and the director of graduate studies is required.
- The course is one in which a student has received a permanent IN (*see Grades*).

### **Transfer Credit**

Consideration is given to the transfer of credit in three categories:

- Previous graduate work for which a degree was not awarded.
- Graduate work completed elsewhere after admission to UIC and for which a degree was not awarded. Students considering taking graduate work elsewhere during a leave of absence should consult their advisor and director of graduate studies about such plans and the courses that may be considered for transfer.
- Graduate work completed in the senior year at UIC that was not applied to the baccalaureate.

To be considered for transfer, graduate work must have been completed in an accredited institution approved by one of the regional accreditation associations or by the agencies recognized by the Council on Postsecondary Education and must meet the quality and content of courses offered at UIC.

For probation and graduation purposes, transfer credit is not computed in the cumulative grade point average or Graduate Degree GPA unless such credit was earned in courses taken at UIC.

### **Limits on Transfer Credit**

The specific number of credit hours accepted for transfer is determined on an individual basis. No transfer is automatic.

*Maximum Allowed Transfer Credit:* No more than 25 percent of the hours required for a master's degree requiring 3–47 hours of credit, or more than 50 percent of the hours required for a master's degree requiring 48 or more hours of credit, can be transferred from another institution or another college at UIC. Doctoral students may transfer in no more than 25 percent of the hours required for the degree. This limit is for courses taken as a student in another college at UIC or another institution, but not course work taken in a different program within the Graduate College at UIC. Transfer credit is considered only for courses in which the student received a grade of A or B. Credit earned more than six calendar years before admission to the Graduate College is not usually accepted for transfer.

*Nondegree Credit:* Nondegree students who are admitted as degree candidates may, by petition, transfer up to 12 semester hours of graduate-level courses in which grades of A or B were earned. This does not count towards the limits of transfer credit listed above.

### **Procedures**

*A Graduate Petition for Transfer Credit Toward an Advanced Degree* is required for all transfers of credit except the 32 hours of credit for a prior master's degree (see below). The graduate program evaluates the student's petition and makes a recommendation to the Graduate College. The petition should show the courses recommended for transfer by the graduate program and the number of semester hours of credit received. Students must attach to the petition an original transcript showing grades if courses were not taken at UIC and a certification from the registrar or college dean of the applicable institution stating that the courses are graduate-level and were not used toward fulfillment of the requirements for a degree if not self-evident from the transcript itself.

### **Credit for Prior Master's Degree**

Doctoral candidates who have previously earned a master's degree or its equivalent approved by one of the regional accreditation associations or by the agencies recognized by the Council on Postsecondary Education may be granted 32 semester hours of credit toward the doctoral degree if approved by the program and the Graduate College at the time of admission. The 32 hours are subtracted from the total hours required from the baccalaureate. The 32 hours are not counted toward the maximum allowed transfer credit limit or computed in the cumulative GPA or Graduate Degree GPA. A petition is not required.

### **Degree Requirements**

*The following requirements for individual degrees are the minimum standards of the Graduate College. Most graduate programs have requirements that exceed these minimums.* Consult the detailed graduate program listings and the graduate program director for a full statement of the requirements of your particular degree program. It is the student's responsibility to be aware of all regulations and requirements and to satisfy them as early as possible.

### **Changes in Degree Requirements**

Program and Graduate College policies and requirements change periodically and may not be immediately reflected in campus publications. New degree requirements, however, are not imposed retroactively on continuing graduate students. If

degree requirements are changed, students may complete their degree programs under the requirements in effect at the time of their initial enrollment (readmission, if they have discontinued degree status) in the Graduate College. They have the option, however, of electing to be governed by the new requirements if they so desire, provided that all requirements of one catalog are met.

Students who interrupt their enrollment without prior formal approval lose their status as graduate students. If they want to return they must apply for readmission. For readmitted students the requirements for the degree are those published in the catalog at the time of readmission, or any subsequent catalog, provided all the requirements of one catalog are met.

### **Degree Program Deadlines**

Master's degree (32 to 40 hours): 5 years

Master's degree (41 to 64 hours): 6 years

Doctorate with prior master's degree (minimum 64 hours): 7 years

Doctorate without master's degree (minimum 96 hours): 9 years

*Students who do not graduate by these deadlines will be dismissed from the Graduate College for failure to progress.*

### **Master's Degrees**

#### **Minimum Semester Hours Required**

At least 32 beyond the baccalaureate; some degree programs require more.

#### **Course Work**

At least 24 hours, or one-half of the minimum number of semester hours of graduate work required for the degree, whichever is greater, must be earned as a degree candidate at UIC. At least nine hours must be at the 500 level, excluding project (597), thesis (598), and independent study courses.

*Credit:* Only 400- and 500-level courses can be applied to a graduate degree. Credit toward a graduate degree is only given for courses in which a student received a grade of A, B, C, P, or S. Graduate programs may establish higher standards.

*Registration:* Master's students who have completed all course credit requirements but have not yet completed a graduation requirement (e.g., thesis, project, or comprehensive examination) are not required to register unless they hold a fellowship, assistantship, or tuition and service-fee waiver. Students who are on a time-limited visa or are in programs that require continuous registration must petition the program and the Graduate College to register for zero hours in an appropriate course (thesis or project).

#### **Foreign Language**

Not required by the Graduate College; may be required by the program.

#### **Comprehensive Examination**

Not required by the Graduate College; may be required by the program. The candidate must be in good academic standing in the Graduate College and the department and have completed all other degree requirements.

#### **Thesis or Project**

Not required by the Graduate College; may be required by the program. Thesis students must earn at least five hours in thesis research (the 598 course offered by their program). A maximum of 40 percent of the total hours of credit required for the degree may be earned in thesis research unless restricted by the program.

*Defense:* Once the student has completed all graduation requirements and is in good academic standing, s/he must defend the thesis before a committee. The thesis committee is appointed by the dean of the Graduate College on the recommendation of the student's department or program.

This committee consists of at least three persons, one of whom should be a tenured, full member of the UIC graduate faculty. One member of the committee may be from outside the department, academic unit, or outside the university, in which case the member must demonstrate equivalent academic standards and his/her curriculum vitae must accompany the Committee Recommendation Form. A Committee Recommendation Form must be submitted to the Graduate College at least three weeks prior to the thesis defense. A majority of the committee must approve the thesis. A candidate cannot be passed if more than one vote of "fail" is reported. The department head or the director of graduate studies will be required to sign the Certificate of Approval Form before a student is considered to have met all the requirements of the thesis. All committee members should be present at the defense.

Specific instructions on the format of the thesis are contained in the booklet, *Thesis Manual*, available in the Graduate College office, 606 University Hall, and on the Graduate College Web site.

### **Time Limits**

In graduate programs requiring 32 to 40 semester hours of graduate work, candidates must complete all of the requirements within five consecutive calendar years after their initial registration in the Graduate College. For programs requiring 41 to 64 semester hours of graduate work the time limit is six consecutive calendar years. Students pursuing more than one degree at the same time will be given an additional two years. Students who do not graduate by these deadlines will be dismissed from the Graduate College for failure to progress. Time spent on a leave of absence approved by the program and the Graduate College is not counted toward the degree time limit (*see Leave of Absence*).

### **Commencement**

Attendance at commencement is voluntary. The yearly commencement exercises in May recognize all students awarded degrees in the previous three terms.

## **Doctoral Degrees**

### **Minimum Semester Hours Required**

At least 96 from the baccalaureate or at least 64 from the master's degree; some degree programs require more.

### **Credit for Prior Master's Degree**

Doctoral candidates who have previously earned a master's degree or its equivalent from UIC or another accredited institution may be granted 32 semester hours of credit toward the doctoral degree if approved by the program and the Graduate College at the time of admission. Degree equivalency from foreign institutions is determined by the Office of Admissions. The 32 hours are subtracted from the total hours required from the baccalaureate. The 32 hours are not included in the maximum allowed transfer credit limit. A petition is not required.

### **Course Work**

At least 48 semester hours beyond the master's level or its equivalent must be taken at UIC. The formal course requirements for a master's degree must be met within the 96 hours.

*Credit:* Only 400- and 500-level courses can be applied to the degree. Credit toward a graduate degree is only given for courses in which a student received a grade of A, B, C, P, or S. Graduate programs may establish higher standards.

*Registration:* Doctoral candidates must be registered for credit the term when they take the preliminary exam. They must also register each semester (excluding summer) after passing the preliminary examination and until successfully defending the dissertation. Students must register for the summer term if they are taking the preliminary exam or

defending their dissertation during that term.

Students who hold a fellowship, assistantship, or tuition and fee waiver must register each semester for the number of hours required by their award, even if they have completed all degree requirements except the dissertation. (*See Course Loads, Financial Aid* section)

Students who do not hold a fellowship, assistantship, or tuition and fee waiver, who have completed all degree requirements except the dissertation, and who do not wish to register for additional course work, must either:

Option A: Register for zero hours of credit in thesis research (599) each semester until the degree is awarded (excluding summer unless defending dissertation). Range IV tuition and fees are assessed (*see UIC Timetable*), or

Option B: Must petition for each renewal and specify Option B. Only the range IV tuition is changed (*see UIC Timetable*). No fees are assessed. Students may elect from one to two terms with each petition. Students who elect this option are ineligible for student health insurance, library and laboratory privileges, computer facilities, an ID card, and loan deferment.

Permission to use either Option A or B will be considered by the Graduate College upon petition supported by the graduate program. For Option B, the department must certify that no use of university facilities will be made. Students must refile a petition for Option B by the 10th day of the term (fifth for summer).

All students must complete and defend the dissertation by the degree deadline, regardless of which option is chosen.

### **Foreign Language**

Not required by the Graduate College; may be required by the program.

### **Examinations**

*Departmental Qualifying Examination:* Not required by the Graduate College; may be required by the program.

*Preliminary Examination (Admission to Candidacy)*

*Purpose:* The purpose of the Preliminary Examination is to determine the candidate's readiness to undertake dissertation research, and passing it constitutes formal Admission to Candidacy. The examination serves as the last major step toward the PhD degree except for the completion and defense of the dissertation. The examination provides the student with timely feedback of the faculty's views of his/her potential for completing the PhD program. The preliminary examination is distinct from the oral defense of the dissertation project.

*Timing:* The preliminary examination is generally administered during or near the end of the time the student has completed most, though not necessarily all, of the course work, but has not made a major investment of time and effort towards the dissertation research project. A minimum of one year has to elapse before the defense of the dissertation after passing the preliminary examination. Only students in good academic standing are permitted to take the examination.

*Committee Composition:* The committee for the preliminary examination is appointed by the dean of the Graduate College upon the recommendation of the department or program. The committee consists of at least five (5) members, of whom at least three (3) are UIC Graduate Faculty with full membership, and two (2) of whom must be tenured. The chair of the Committee must be a full member of the UIC Graduate Faculty.

*Grading:* Each member of the examining committee assigns a grade of "pass" or "fail." A candidate cannot be passed with more than one "fail" vote. The committee may require that specific conditions be met before the "pass" recommendation becomes effective. On the recommendation of the committee, the head or chair may permit a second examination. A third examination is not permitted.

*Procedure:* The dean of the Graduate College appoints the committee upon receipt of the Committee Recommendation



Form three (3) weeks prior to the preliminary examination. The results of the examination must be submitted to the Graduate College within two (2) weeks of the completion of the exam. The Examination Report must be signed by all members of the committee. Once the student has passed the examination, the dean of the Graduate College will notify the student that s/he has been admitted to candidacy.

Students who do not complete the degree requirements within five (5) years of passing the preliminary examination must retake the examination; programs may specify a shorter time period. Combined programs leading to two degrees may require additional study beyond the period normally involved for completing requirements for the PhD degree and may require an extension of the five-year rule.

### **Dissertation**

Required.

*Format:* The format of the dissertation is specified in the booklet, *Thesis Manual*. Students should have a draft of their dissertation checked in their department prior to the term they plan to graduate. Programs are responsible for checking the format and adhering to the guidelines. Students must deposit two copies of their defended and departmentally approved dissertation to the Graduate College by the deadline for that term. An abstract (350 words maximum) with its own title page must be submitted with the final copy.

*Prior Publication of Research Findings:* Candidates engaged in thesis research may find it desirable or expedient to publish, prior to the conferring of the degree, certain findings that later will be incorporated in the dissertation. In such cases, appropriate acknowledgment of the earlier publication should be included in the dissertation. The Graduate College encourages such publication, but the dissertation may not be published in its entirety before all degree requirements, including the defense of the dissertation, have been completed.

*Defense:* The defense of the dissertation is administered after the student has completed all graduation requirements. Only students in good academic standing are permitted to defend their dissertation.

All candidates for the PhD degree must have an advisor who is a member of the UIC graduate faculty. The advisor is considered the primary reader of the dissertation. The defense must be open to the academic community of the university and be publicly announced one week prior to its occurrence.

The dissertation committee is appointed by the dean of the Graduate College on the recommendation of the student's department or program. The defense committee consists of at least five persons, of whom one must be from outside their program. The chair of the committee must be a full member of the UIC graduate faculty. At least two members of the committee must be tenured faculty at UIC; at least one must be from outside the degree-granting program, *which may include graduate faculty from other UIC departments or colleges*. The outside member can also be from outside the university, in which case the member must demonstrate equivalent academic standards; the member's curriculum vitae must accompany the Committee Recommendation Form. A Committee Recommendation Form must be submitted to the Graduate College three weeks prior to the dissertation defense. The committee vote is "pass" or "fail." A candidate cannot be passed if more than one vote of "fail" is reported. The department head or director of graduate studies signature is required on the Committee Recommendation Form before a student is considered to have met the requirements of the dissertation.

*Deadlines:* Two final, approved, and defended copies of the dissertation must be submitted to the Graduate College

no later than the Graduate College deadline for that term. PhD candidates who successfully defend their dissertation and submit the final dissertation copy to the Graduate College after the deadline will graduate in the next term.

*Microfilm Fee:* Following the final examination and acceptance of the thesis, candidates must pay a fee for the microfilming of the complete dissertation and the publication of the abstract in *Dissertation Abstracts*. Consult the *Thesis Manual* for more information.

### **Teaching**

Required.

### **Time Limits**

Students admitted to the Graduate College with a master's degree or who continue in the Graduate College after completing the master's degree at UIC must complete the degree requirements within seven consecutive calendar years after initial registration as a doctoral student. Students admitted to the Graduate College without a master's degree who proceed directly to the doctorate must complete degree requirements within nine consecutive calendar years of initial registration as a doctoral student. Students who do not graduate by these deadlines will be dismissed from the Graduate College for failure to progress. Time spent on a leave of absence approved by the program and the Graduate College is not counted toward the degree time limit (*see Leave of Absence*).

### **Commencement**

Attendance at commencement is voluntary. Because doctoral candidates are individually recognized and hooded by their research advisor at the ceremony, they must inform the Graduate College whether or not they will attend. The yearly commencement exercises in May recognize all students awarded degrees in the previous three terms.

## **University Regulations**

### **Academic Grievance Procedures**

The Academic Grievance Procedures (July 1, 1989) define an administrative process through which faculty, academic professionals, employees, and students may seek resolution of complaints or grievances arising from a decision made about them by an agent of the University of Illinois at Chicago in the course of their employment or enrollment at UIC. It defines eligibility to use the procedures and describes the informal and formal procedures and time frames required. This document is available in the Graduate College office, 609 University Hall.

### **Academic Integrity**

The University of Illinois is dedicated to learning and research, and hence is committed to truth and accuracy. Integrity and intellectual honesty in scholarship and scientific investigation are, therefore, of paramount importance. These standards require intellectual honesty in conducting research, writing of research results, and relations with colleagues. Graduate students may be faced with difficult choices regarding academic integrity in their various roles as student, teacher, and researcher. If this is the case, they should seek the advice and experience of their faculty advisors and the Graduate College staff.

The university publishes two documents that contain specific definitions of misconduct (such as plagiarism, falsification of data, etc.), procedures used for investigation of charges, and the consequences of that conduct. Students are governed by the Student Disciplinary Procedures (October 1993) and faculty are governed by the Policies and Procedures for Academic Integrity (June 1989).

### **Confidentiality of Records**

As custodian of student records, the university assumes an implicit trust and, accordingly, uses extreme care and concern in recording and disseminating information about students. The university policy is in compliance with the Family Educational Rights and Privacy Act.

The Office of Admissions and Records issues transcripts of official records only at the written request of the student and payment of the transcript fee (see Tuition, Fees, and Other Charges). The same holds true for academic information needed for financial assistance or honors recognition. Class schedules are not released to unauthorized persons. UIC Student Records policy governs record keeping and release.

### **Medical Immunization Requirements**

Illinois state law mandates that all students entering a postsecondary institution who are born on or after January 1, 1957, must present documented proof of immunity against measles, mumps, rubella, tetanus, and diphtheria as a prerequisite to registration. The *Medical Immunization Form*, required for student completion, is mailed with the student's acceptance letter.

Those students who are not properly immunized and have not submitted a written statement of medical or religious exemption must be immunized within the first term of enrollment. Failure to provide the required proof of immunity will prevent the student from enrolling in a subsequent term.

Students registering only for off-campus courses or for no more than five credit hours are temporarily exempt from the immunization requirements.

For more information, contact the Office of Medical Immunization Records, Room 1300 Student Services Building, telephone (312) 413-0464.

### **Nondiscrimination Policy**

The commitment of the university to the most fundamental principles of academic freedom, equality of opportunity, and human dignity requires that decisions involving students and employees be based on individual merit and be free from invidious discrimination in all its forms.

It is the policy of the University of Illinois not to engage in discrimination or harassment against any person because of race, color, religion, sex, national origin, ancestry, age, marital status, disability, sexual orientation, unfavorable discharge from the military, or status as a disabled veteran or a veteran of the Vietnam era and to comply with all federal and state nondiscrimination, equal opportunity, and affirmative action laws, orders, and regulations. The nondiscrimination policy applies to admissions, employment, and access to and treatment in the university programs and activities. Complaints of invidious discrimination prohibited by university policy are to be resolved within existing university procedures.

For additional information or assistance on the equal opportunity, affirmative action, and harassment policies and procedures of the University of Illinois at Chicago, please contact:

Associate Chancellor in the Office for Access and Equity  
(Title IX, ADA and 504 Coordinator)  
717 Marshfield Building (MC 602)  
809 South Marshfield Avenue  
Chicago, Illinois 60612-7227  
(312) 996-8670

### **Services for Students with Disabilities**

The Office of Disability Services works to ensure the accessibility of UIC programs, classes, and services to students with disabilities. Services are available for students who have documented disabilities, including vision or

hearing impairments and emotional or physical disabilities. Students with disability/access needs or questions may contact the Office of Disability Services at (312) 413-2183 (voice) or (312) 413-0123 (TTY only).

### **Participation in Class Exercises that Involve the Use of Animals**

The University of Illinois at Chicago offers certain courses in which live, euthanized, or preserved vertebrate animals are used as part of course requirements. Such courses are identified in the *Timetable* with the note "animals used in instruction."

Students who have ethical concerns about the use of animals in teaching have the responsibility to contact the instructor, prior to enrollment in any course in which animals may be used as part of course instruction, to determine whether class exercises involving animals are optional or required, and what alternatives, if any, are available. If no alternatives are available, the refusal to participate in required activities involving animals may result in a failing grade in the course.

### **Research on Humans or Animals**

Students using human subjects in any research (this includes surveys, interviews, preexisting data, and human tissue obtained for nonresearch purposes) must have approval from the Institutional Review Board or one of its approved committees before they begin data collection. Students using animal subjects must take GC 470 (Essentials for Animal Research). The Graduate College also offers a course (GC 401) on Scientific Integrity and Responsible Research. This course is mandatory for a number of graduate programs. Similar programs for non-science disciplines are being developed. For further information contact the Office for the Protection from Research Risks at 996-4995, 310 Administrative Office Building.

### **Sexual Harassment Policy**

Sexual harassment is defined by law and includes any unwanted sexual gesture, physical contact, or statement that is offensive, humiliating, or an interference with required tasks or career opportunities at the university. Sexual harassment is prohibited under federal and state discrimination laws and the regulations of the Equal Employment Opportunity Commission.

The University of Illinois will not tolerate sexual harassment of students or employees and will take action to provide remedies when such harassment is discovered. The university environment must be free of sexual harassment in work and study.

In order to assure that the university is free of sexual harassment, appropriate sanctions will be imposed on offenders in a case-by-case manner.

The university will respond to every complaint of sexual harassment reported.

Information about the university's approved procedures for dealing with cases of sexual harassment may be obtained by phoning (without name given if desired), by writing, or by visiting the Office for Access and Equity, 717 Marshfield Building, 809 South Marshfield Avenue, Phone (312) 996-8670.

### **Student Disciplinary Procedures**

The Student Disciplinary Procedures (December 1985) provide a mechanism for review when a student is charged with an infraction of the disciplinary code. It describes just causes for disciplinary action, outlines the procedures for filing a complaint or responding to one, lists the possible sanctions, and describes the appeal process. This document is available in the Office of the Dean of Student Affairs, 3030 Student Services Building.

## **Tuition, Fees, and Other Charges**

All students are assessed tuition and fees. The amount varies with the number of credit hours for which the student registers and according to status as a resident or nonresident of Illinois. Residence classification is determined by the information given on the application for admission and other credentials. Further information on resident classification is provided elsewhere in this chapter. Contact the Graduate College for information on current tuition and fee rates.

The Service Fee, General Fee, and Health Service Fee are mandatory fees that support the following: Circle Center and Illini Union, Student Programs, Student Counseling, Intramural Sports and Recreation, Intercollegiate Athletics, Bonded Indebtedness, Health Service, and Pharmacy. In addition, all students are covered by the UIC Student Health Insurance (Megalife) and an accidental death and dismemberment policy for which they pay a fee each term. Students who present evidence of insurance in force that provides equivalent coverage may apply for an exemption from the student health insurance fee.

Students who present evidence of equivalent medical insurance coverage to that offered by the UIC Student Health Insurance office do not have to pay this fee. See the *Timetable* for more specific information on the waiver process.

### **Encumbrance of Registration and Records**

Students who owe any money to the university will have a hold placed on their academic records. This hold precludes students from registering for any subsequent terms. In addition, transcripts will not be released until the student's account has been paid in full.

Past due accounts are subject to a FINANCE CHARGE at the ANNUAL PERCENTAGE rate of 18% (1.5 per month on the unpaid balance of each month). Additionally, a LATE FEE of \$2.00 per month will be added to all past due accounts.

Please note, the University of Illinois at Chicago does refer past due accounts for collection. Where appropriate, the university will authorize legal action to effect settlement of an account. Students will be liable for all reasonable collection costs, including attorney fees and other charges necessary for the collection of a past due account.

### **Tuition Exemptions**

Students may be exempted from one or more of the following charges if they qualify under the stated conditions: Tuition is waived for:

1. Holders of tuition-waiver scholarships.
2. All academic employees of the university (except graduate assistants) on salaried appointment for at least 25 percent of full-time service. Such appointments require service for not less than three-fourths of the number of days defined for the term.
3. Teaching, research, and graduate assistants on appointment for at least 25 percent but not more than 67 percent of full-time service. Such appointments require service for not less than three-fourths of the number of days defined for the term.
4. Support staff employees of the university in status appointments or in appointments designed to qualify for status in an established class (e.g., trainee, intern) who register in regular university courses not to exceed Range II tuition in semester if on full-time appointment, and not to exceed Range III tuition if on a 50 to 99 percent time appointment, provided they (1) meet conditions and eligibility for admission as prescribed by the Office of Admissions and Records, (2) not be students as defined in Civil Service Rule 7.7c, and (3) have approval from their employing departments for enrollment and a makeup schedule to cover any time in course attendance during their regular work schedule.

Employees whose total registration is in a higher range than that authorized by their tuition waiver pay only the

difference between the waiver authorization and the higher range in which their total registration places them.

5. Support staff employees in a status, learner, trainee, apprentice, or provisional appointment who enroll in regular courses directly related to their university employment. The number of credit hours per semester may not exceed Range II. Employees must have made application and received prior approval for enrollment as required by procedures issued by the director of support staff personnel and set forth in Policy and Rules—Nonacademic.

6. Holders of graduate tuition-and-service-fee waivers awarded by the Graduate College.

7. Holders of grants or contracts from outside sponsors that provide payments to cover the total costs of instruction.

8. Cooperating teachers and administrators who receive assignment of practice teachers or TESOL interns. Such persons who register in university courses are exempted from tuition, the service fee, and the general fee for one semester or summer session for each semester of service rendered. The exemption shall apply to the semester or summer session of registration, as designated by the student, that is concurrent with or following the term of service, but must be applied no later than one calendar year from the end of the term of service. Concurrent registration on more than one campus of the university or in university extramural courses constitutes one semester or session of eligibility for exemption.

9. Persons registered in noncredit seminars only. University employees registered at the request of their departments in noncredit courses especially established to improve the work of the employee.

10. University of Illinois retirees.

11. Teacher of the year.

The nonresident portion of tuition (if the enrollee is subject to payment of tuition) is waived for:

1. All staff members (academic, including teaching and research assistants, administrative, or permanent nonacademic) on appointment for at least 25 percent of full-time with the university.

2. The faculties of state-supported institutions of higher education in Illinois holding appointments of at least one-quarter time.

3. The professional staff in private and public elementary and secondary schools in Illinois.

4. The spouses and dependent children of those listed in 1 and 2. (Dependent children are those who qualify as dependents for federal income tax purposes.)

5. Persons actively serving in one of the armed forces of the United States who are stationed and present in Illinois in connection with that service.

6. The spouses and dependent children of those listed in 5, as long as they remain stationed, present, and living in Illinois.

### **Regulations Governing the Determination of Residency Status for Admission and Assessment of Student Tuition**

In all cases where records establish that the person does not meet the requirements for Resident status as defined in these regulations, the Nonresident status shall be assigned. Exceptions to the regulations are clearly indicated.

#### **Residency Determination**

Evidence for determination of residence status of each applicant for admission to the university shall be submitted to the director of the Office of Admissions and Records at the time of application for admission. A student may be reclassified at any time by the university upon the basis of additional or changed information. However, if the student is classified in error as a resident student, the change in tuition shall be applicable beginning with the term following the reclassification; if the student is classified in error as a nonresident, the change in tuition shall be applicable to the



term in which the reclassification occurs, provided the student has filed a written request for a review in accordance with these regulations.

Further information or clarification may be secured by contacting the director of the Office of Admissions and Records:

Office of Admissions and Records (MC 018)  
University of Illinois at Chicago  
Student Services Building  
P.O. Box 5220  
Chicago, Illinois 60680

## **Fees**

### **Service Fee**

The service fee is waived for:

1. All staff members of the university who are on appointment for at least 25 percent of full-time service, provided the appointments require service for not less than three-fourths of the number of days defined for the term.
2. Holders of graduate tuition-and-fee waivers awarded by the Graduate College.
3. Students registered in absentia.
4. Students registered only in courses taught off campus.
5. Holders of grants or contracts from outside sponsors if the service fee is charged to the contract or to grant funds.
6. Cooperating teachers and administrators who meet the qualifications of item 6 of Tuition Exemptions.
7. Persons registered only in noncredit seminars.
8. University employees, registered at the request of their departments, in noncredit courses for the purpose of improving their work.
9. Emeriti.

### **Definitions**

For fee assessment purposes, a staff appointment must require service for not less than three-fourths of the number of days defined for the academic term. Specific dates marking completion of service for three-fourths of the term shall be established by the chancellor or the chancellor's designee on each campus. Staff tuition-and-fee privileges do not apply to students employed on an hourly basis in either an academic or nonacademic capacity or to persons on leave without pay.

For fee assessment purposes, a permanent nonacademic employee is defined as a person who has been assigned to an established, permanent, and continuous nonacademic position and who is employed for at least 25 percent of full-time. University employees appointed to established civil service positions whose rate of pay is determined by negotiation, prevailing rates, or union affiliation are entitled to the same tuition-and-fee privileges accorded other staff members under the regulations.

Students who resign a staff appointment, or whose appointment is cancelled before they have rendered service for at least three-fourths of the number of days defined for the term, become subject to the full amount of the appropriate tuition and fees for that term unless they withdraw from university classes at the same time the appointment becomes void or unless they file clearance for graduation within one week after the appointment becomes void.

### **Course Fee**

This fee is assessed of all auditors who are not in Range I in the tuition and fee schedule. UIC students registered for at least 12 semester hours and university employees who are eligible for a tuition waiver do not have to pay the Course Auditor's fee. Contact the Office of Admissions and Records for current fee information.

### **UIC Student Health Insurance (Mega Life)**

Fee automatically assessed with tuition. Deadline to waive fee, to add or terminate dependent coverage, to reinstate

insurance, or to apply for Nonregistered Coverage, is Friday of the seventh week of the term.

UIC offers a comprehensive health care plan for students. The Mega Life and Health Insurance Company is the insurance provider. Campus-based services are provided through the resources of the UIC medical community. For registered students, coverage is continuous, beginning with the first day of the term until the first day of the next term. For nonregistered terms, including summer, see the section on Continuing Coverage.

*Primary Care:* Primary care at UIC is provided by appointment at the Family Medical Center, located at 1801 West Taylor, 4 North. Prescriptions can be filled at the UIC Pharmacy, located in the Eye and Ear Infirmary, 1855 West Taylor. Routine office visits will be "by appointment" during normal business hours and urgent conditions will be seen within 1–2 working days of contact with Family Medicine's Urgent Care system. Visits for other illnesses or injury will be billed to Mega Life or to the student's other insurance.

*Option to Waive Coverage:* If you are covered under another health insurance plan, you may choose to waive coverage by submitting a Waiver Form along with proof of comparable coverage (i.e., a copy of your health insurance card or letter from your insurance company or employer) before the waiver deadline for the term for which the waiver is requested. Before waiving coverage, please review your existing health plan carefully, paying special attention to eligibility and maximum age requirements, benefits, deductibles, copayments, and premiums. The waiver is permanent unless you submit a reinstatement application to the Insurance Office (subject to a determination of eligibility).

*Dependent Coverage:* To enroll your eligible dependents (spouse or children) in the Student Health Insurance Plan, submit an application before the deadline for the term requested. The additional premium will be assessed on your student account. To terminate dependent coverage, a request must be submitted in writing to the Insurance Office by the waiver deadline. An insured student may cover a newly acquired dependent by completing the enrollment form within 30 days of marriage, birth, or other acquisition (e.g. legal adoption) of a dependent.

*Continuing Coverage (as a nonregistered student):* All students who have been continuously insured under the policy for at least six consecutive months and who no longer meet the eligibility requirements under the policy are eligible to continue their coverage for a period of not more than six months under the school's student policy. An application must be made within the established timeframe along with the payment to the Mega Life and Health Insurance Company.

*Reinstatement:* Reinstatement within the enrollment period is allowed. The effective date is the first day of the semester that the reinstatement is requested. You are responsible for the full semester premium and the premium will be assessed on your student account each semester that you are registered for classes.

Reinstatement outside of the enrollment period is allowed due to: change in your/your spouse's employment status, court order resulting in gaining custody of a dependent, or court decree establishing financial responsibility for a child's medical care. You have 30 days from the date of event to submit a reinstatement application along with proper documentation. You will pay the full semester premium and this premium will be assessed on your student account each semester that you are registered for classes.

*Information:* Information on benefits, dependent coverage, fee waiver, or anything else related to student health insurance is available from Mega Life representatives located in the Office of Student Development Services, 1600 SSB. Telephone number is (312) 996-3553; fax number is (312) 413-7872. Visit our Web site at [www.student-resources.net](http://www.student-resources.net).

### **Late Registration Fine**

This fine is levied against all students who complete registration after the deadline. In extenuating circumstances, students may receive the approval of the dean of the college to register after the tenth day of the semester or the fifth day of the summer session. Consult the Timetable for current registration deadlines and late registration fine information.

### **Student-to-Student Fee**

While all students will be assessed this mandatory fee at registration, refunds are available upon request. A request for refund must be supported by a confirmed schedule and university photo ID card during the first two weeks of the term. This is processed through SINCE, located on the first floor of CCC. West side students may pick up a credit form in Room 111 Marshfield Building.

### **General Fee**

This fee is not waived with a tuition and fee waiver.

### **Replacement Photo-Identification Card Fee**

This fee is assessed if the card is lost or destroyed.

### **Withdrawal from the University**

Withdrawal from the university is governed by specific regulations that students should observe to protect their academic standing. Failure to withdraw officially from the university before the last day of instruction results in a grade of E (failure) appearing on the record for each course in which the student is registered. Students dropping the only course for which they are enrolled should follow university withdrawal procedures.

Students who withdraw by the tenth day of the semester (fifth day in summer) are not considered to have been registered for that term, and the withdrawn courses will not appear on the student's transcript. Students who withdraw after the tenth day (fifth in summer) are considered "in residence" for that term, and are eligible to register for the next term. The withdrawn courses will appear on their transcript with a "W" grade.

Graduate students who wish to withdraw may secure copies of the withdrawal form from their director of graduate studies or the Graduate College. Graduate students in a degree program should initiate official withdrawal by consulting their director of graduate studies for approval. Nondegree students who were not admitted to a specific department should initiate withdrawal from the Graduate College.

**Graduate students who fail to register for two terms in a row (excluding summer) without taking an approved leave of absence forfeit their admission to the Graduate College.** Like students who have officially withdrawn from the university before the tenth day of the semester (fifth day in summer), they must reapply for admission to the Graduate College. Readmission is not guaranteed.

### **Withdrawal to Enter Military Service**

A graduate student who must leave the university in order to enter into active service with the armed forces in a national or state emergency (including being called up for the Active Reserve Forces and the National Guard) during the first twelve weeks of the semester (first six weeks in summer session) will be withdrawn from courses with a full refund of tuition and fees. If called to active duty after that time, and before the end of the term, the student may withdraw from all courses with a full refund of tuition and fees, or the student may ask the instructor(s) for permission to receive an Incomplete (IN) or Deferred (DF) grade(s). An instructor may assign an IN or DF if deemed academically appropriate and feasible. Alternatively, an instructor may assign a letter grade, if requested by the student, if the instructor deems it to be academically justified. Deadlines for incomplete grades under these circumstances may be waived upon the discretion of the

instructor and the Graduate College. A student who chooses to withdraw from all courses will not receive a "W." It is the student's responsibility to present proof of active service status for these actions to occur. (See *Financial Obligations and Refunds* for additional information.)

### **Financial Obligations and Refunds**

Students should carefully check their registration printouts to ensure that they are officially registered in the correct courses and sections for the correct number of credit hours. The act of registering for courses obligates students to pay all related tuition and fees unless one of the following procedures takes place:

**Cancellation of Registration:** If a student completes and delivers a registration cancellation form to the Office of Registration and Records or drops all courses and informs the registration office before the first day of the term, he/she is eligible for a full tuition and fee refund.

**Withdrawal from the University:** A prorata refund of tuition and fees (excluding health service and Student Health Insurance fees) will be issued to students who withdraw on or before the tenth week of the semester. Before a refund is made to the student, the university will make a refund to the appropriate financial aid programs providing assistance to the student. Any amount remaining will be paid to the student.

**Dropping a Course:** If, between the second and tenth day (fifth day in the summer), a student drops a course(s) and by so doing changes the tuition range, he or she is eligible to receive a refund or credit for the difference in range.

**Withdrawal by an Auditor:** A full refund is issued if the withdrawal is made within the first ten days of instruction of the semester or the first five days of instruction of the summer session. Thereafter, no refund is made.

**Refund on Withdrawal to Enter Military Service:** A graduate student who must withdraw due to being called into active service with the armed forces in a national or state emergency (including being called up for the Active Reserve Forces and the National Guard) will receive a full refund of tuition and fees. The refund of tuition and fees for graduate students who receive financial aid from federal and state programs and private foundations will be governed according to the rules and regulations of those organizations. For students who hold fellowships, the Graduate College will make every effort to restore those awards upon return to UIC. Assistantships (teaching, research, or graduate) are awarded by colleges, graduate programs, research centers, and administrative offices, and graduate students who have assistantships should check with those units about the availability of the assistantships upon return from active military service. Graduate students living in university residences will receive a pro rata refund for room and board based on the date of withdrawal. It is the student's responsibility to present proof of active service status for these actions to occur. (See *Withdrawal From the University* for additional information.)

**The above refund policies do not apply to the application fee, which is not refundable.**

### **Transcripts**

Students who have paid all university fees can obtain their transcripts by submitting a written request to the Office of Admissions and Records and paying the transcript fee. Transcripts and other academic information are provided by the Office of Admissions and Records only at the written request of the student. Contact the Office of Admissions and Records for current fees.

Students needing certification of completion of degree requirements may obtain such certification from the Office of Admissions and Records upon request from the Graduate College.



# Graduate Faculty

## College of Applied Health Sciences

### School of Biomedical and Health Information Sciences

John M. Daugherty, MS, University of Michigan  
Alice A. Katz, PhD, University of Illinois at Chicago  
Donald Mon, PhD, Loyola University  
Walter B. Panko, PhD, University of Missouri  
Russell Pearl, MD, University of Illinois  
Alfred P. Teoli, MFA, University of Michigan  
Annette L. Valenta, DrPH, University of Illinois at Chicago  
June D. Wencel-Drake, PhD, University of Illinois at Chicago

### Department of Disability and Human Development

Gary Albrecht, PhD, Emory University  
Fabricio Balcazar, PhD, University of Kansas  
Patrick Devlieger, PhD, University of Illinois at Urbana-Champaign  
Glenn Fujiura, PhD, University of Illinois at Urbana-Champaign  
Carol Gill, PhD, University of Illinois at Chicago  
Joy Hammel, PhD, OTR, University of California, Berkeley  
Tamar Heller, PhD, University of Illinois at Chicago  
Christopher Keys, PhD, University of Cincinnati  
David Mitchell, PhD, University of Michigan  
James Rimmer, PhD, Texas Woman's University  
William J. Schiller, PhD, University of Illinois at Chicago  
Sharon Lynn Snyder, PhD, University of Michigan-Ann Arbor  
Kenneth Swiatek, PhD, University of Illinois at Chicago College of Medicine

### Department of Human Nutrition

Bahram Arjmandi, PhD, Kansas State University  
Phyllis E. Bowen, PhD, Cornell University  
Carol Braunschweig, PhD, University of Michigan  
Alan Diamond, PhD, State University of New York at Stony Brook  
Robert Reynolds, PhD, University of Wisconsin-Madison

### School of Kinesiology

Robert J. Beck, PhD, University of Illinois at Urbana-Champaign  
Daniel M. Corcos, PhD, University of Oregon  
Karyn Esser, PhD, University of Nevada, Las Vegas  
Ziaul Hasan, PhD, Massachusetts Institute of Technology  
Donald R. Hellison, PhD, The Ohio State University  
James S. Horgan, PhD, University of Iowa  
Timothy J. Koh, PhD, University of Calgary  
Lawrence Oscai, PhD, University of Illinois at Urbana-Champaign  
Warren K. Palmer, PhD, University of Iowa  
Mohan Sapru, PhD, National Institute of Mental Health and Neuroscience  
Charles B. Walter, PhD, University of California, Los Angeles

### Department of Occupational Therapy

Marcia L. Finlayson, PhD, University of Manitoba  
Joy M. Hammel, PhD, University of California, Berkeley and San Francisco  
Christine Helfrich, PhD, University of Illinois at Chicago  
Gary W. Kielhofner, DrPH, University of California, Los Angeles  
Renee R. Taylor, PhD, DePaul University  
Craig A. Velozo, PhD, Ohio University

### Department of Physical Therapy

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Suzann K. Campbell, PhD, PT, University of Wisconsin-Madison  
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Hlapang Kolobe, PhD, Hahemann University  
Sandra J. Levi, PhD, Northwestern University  
Sandra B. Levine, PhD, PT, Loyola University Chicago  
Clive Yi-Chung Pai, PhD, University of Iowa  
Jules M. Rothstein, PhD, PT, New York University

## College of Architecture and the Arts

### School of Architecture

Bruno Ast, MArch, University of Illinois at Urbana-Champaign  
Stuart Cohen, MArch, Cornell University  
James M. Dalton, MArch, University of Illinois at Urbana-Champaign  
Edward L. Deam, MArch, University of Pennsylvania  
Elliott E. Dudnik, PhD, Northwestern University  
Roberta Feldman, PhD, City University of New York  
Lloyd Gadau, BArch, University of Illinois at Urbana-Champaign  
Douglas A. Garofalo, MArch, Yale University  
Michael S. Gelick, MArch, Massachusetts Institute of Technology  
Sharon Haar, MArch, Princeton University  
Jormakka Kari, PhD, Tampere University of Technology (Finland)  
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Sidney Robinson, ArchD, University of Michigan  
Katerina Ruedi, AA Diploma with Honors, The Architectural Association  
Kenneth A. Schroeder, MArch, University of Toronto  
Charles Waldheim, MArch, University of Pennsylvania

### School of Art and Design

William S. Becker, MFA, Cranbrook Academy of Art  
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Phyllis Bramson, MFA, School of the Art Institute of Chicago  
Drew R. Browning, MFA, School of the Art Institute of Chicago  
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Julia Fish, MFA, The Maryland Institute  
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Marta Huszar, MFA, Yale University  
Douglas Ischar, MFA, California Institute of the Arts  
Joseph Jachna, MS, Illinois Institute of Technology  
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Julie Zando, MFA, Bard College

### Department of Art History

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Deborah Fausch, PhD, Princeton University  
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Hannah B. Higgins, PhD, The University of Chicago  
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Virginia E. Miller, PhD, University of Texas at Austin  
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William Kaplan, DMA, University of Michigan  
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## **College of Business Administration**

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### **Department of Periodontics**

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### **Department of Restorative Dentistry**

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James L. Drummond, PhD, University of Illinois  
Kent Knoernschild, MS, University of Iowa  
Ales Obrez, PhD, University of Illinois at Chicago

### **College of Education**

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Mary Bay, PhD, University of Illinois at Chicago  
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Connie Bridge, PhD, University of Arizona  
Stephanie P. Carter, PhD, Vanderbilt University  
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Lesley Craig-Unkefer, EdD, Vanderbilt University  
Elizabeth M. Delaney, EdD, Peabody College, Vanderbilt  
Mavis L. Donahue, EdD, Boston University  
Bernardo Gallegos, PhD, University of New Mexico  
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Eric Gutstein, PhD, University of Wisconsin-Madison  
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Cynthia R. Hynd, EdD, University of Georgia  
James V. Kahn, PhD, Temple University  
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Norma Lopez-Reyna, PhD, University of California, Santa Barbara  
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Flora V. Rodriguez-Brown, PhD, University of Illinois Urbana-Champaign  
Christine Salisbury, PhD, University of Wisconsin-Madison  
William Schubert, PhD, University of Illinois at Urbana-Champaign  
Timothy E. Shanahan, PhD, University of Delaware  
Everett V. Smith, Jr., PhD, University of Connecticut  
Mark A. Smylie, PhD, Vanderbilt University  
David O. Stovall, PhD, University of Illinois at Urbana-Champaign  
Elizabeth Talbott, PhD, University of Virginia  
William H. Teale, EdD, University of Virginia  
Keith Thiede, PhD, University of Washington  
Theresa Thorkildsen, PhD, Purdue University  
Jane Tompkins, PhD, Yale University  
Steven Tozer, PhD, University of Illinois at Urbana-Champaign  
Richard Van Acker, EdD, Northern Illinois University  
Maria Varelas, PhD, University of Illinois at Chicago  
William H. Watkins, PhD, University of Illinois at Chicago  
Ward W. Weldon, PhD, Northwestern University  
Constance M. Yowell, PhD, Stanford University

### **College of Engineering**

#### **Department of Bioengineering**

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Yang Dai, PhD, University of Tsukuba (Japan)  
Margot Damaser, PhD, University of California, Berkeley and San Francisco  
Tejal A. Desai, PhD, University of California, Berkeley and San Francisco  
Daniel Graupe, PhD, University of Liverpool (England)  
Bin He, PhD, Tokyo Institute of Technology  
John Hetling, PhD, University of Illinois at Chicago  
Debra E. Hurwitz, PhD, University of Illinois at Chicago  
Jens Karlsson, PhD, Massachusetts Institute of Technology  
Fei Li, PhD, Virginia Commonwealth University  
Jie Liang, PhD, University of Illinois at Urbana-Champaign  
James Lin, PhD, University of Washington  
Francis Loth, PhD, Georgia Institute of Technology  
Richard Magin, PhD, University of Rochester  
Arif Masud, PhD, Stanford University  
Joaquin Mayoral, PhD, University of Illinois at Chicago  
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Richard Warnecke, PhD, Duke University

#### **Urban Planning and Policy Program**

Kheir M. Al-Kodmany, PhD, University of Illinois at Urbana-Champaign  
John-Jairo Betancur, PhD, University of Illinois at Chicago  
Saurav D. Bhatta, PhD, Cornell University  
James F. Foerster, PhD, University of North Carolina  
Douglas C. Gills, PhD, Northwestern University  
Rebecca M. Hendrick, PhD, Michigan State University  
Charles J. Hoch, PhD, University of California, Los Angeles  
Martin S. Jaffe, JD, Wayne State University  
Timothy P. Johnson, PhD, University of Kentucky, Lexington

Therese J. McGuire, PhD, Princeton University  
Sue McNeil, PhD, Carnegie Mellon University  
Raffaella Y. Nanetti, PhD, University of Michigan  
Michael Pagano, PhD, University of Texas at Austin  
David C. Ranney, PhD, Syracuse University  
Michael J. Shiffer, PhD, University of Illinois at Urbana-Champaign  
Janet L. Smith, PhD, Cleveland State University  
Piyushimita (Vonu) Thakuria, PhD, University of Illinois at Chicago  
Nikolas Theodore, PhD, University of Illinois at Chicago  
James R. Thompson, PhD, Syracuse University  
Rachel N. Weber, PhD, Cornell University  
Eric W. Welch, PhD, Syracuse University  
Marinus W. Wiewel, PhD, Northwestern University  
Curtis R. Winkle, PhD, Rutgers University  
Ting-Wei Zhang, PhD, University of Illinois at Chicago

### ***Institute on Disability and Human Development***

Gary Albrecht, PhD, Emory University  
Fabricio Balcazar, PhD, University of Kansas  
David Braddock, PhD, University of Texas at Austin  
Glenn Fujiura, PhD, University of Illinois at Urbana-Champaign  
Joy Hammel, PhD, University of California, Berkeley  
Tamar Heller, PhD, University of Illinois at Chicago  
Christopher Keys, PhD, University of Cincinnati  
Kenneth Swiateck, PhD, University of Illinois

### ***Research Resources Center***

Robert F. Loizzi, PhD, Iowa State University  
Minu K. Patel, MS, University of Aberdeen (United Kingdom)

### ***Specialized Cancer Center***

Andreas Constantinou, PhD  
Richard C. Moon, PhD, University of Cincinnati  
Sikha Rauth, PhD, University of Calcutta

### ***University Library***

William G. Jones, AMLS, University of Michigan  
Gretchen A. Lagana, MLS, University of Wisconsin-Madison; MA, San Jose State College  
Stephen E. Wiberley, Jr., MLS, State University of New York at Albany; PhD, Yale University



# College of Applied Health Sciences

## Biomedical Visualization

*Mailing Address: Biomedical Visualization (MC 520), Office of Graduate Programs, School of Biomedical and Health Information Sciences, 1919 West Taylor Street, Chicago, Illinois 60612-7249*

*Campus Location: 250 AHSB*

*Curriculum Code: 5348*

*Admission Code: 20FS1075MS*

*Telephone: (312) 996-6317*

*E-mail: sbhisgrad@uic.edu*

*Web Site: www.sbhis.uic.edu*

*Director of Graduate Studies: Annette L. Valenta*

The School of Biomedical and Health Information Sciences (SBHIS) offers a two-year graduate program leading to the Master of Science (MS) degree in biomedical visualization. Course work and research focus on the general areas of computer-based illustration and design; computer visualization; and prosthetics/3D model design. Required core courses emphasize basic science, imaging modalities, and visual problem-solving. The program has affiliations with twenty clinical sites in medical centers, hospitals, veterinary schools, prosthetics clinics, museums, and private businesses for an elective internship experience. SBHIS also offers the MS in health informatics and a certificate in health informatics.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions. Prior academic work must include four drawing courses (at least two must be life drawing), one course each in graphic design, computer graphics, comparative anatomy (or an advanced biology course that includes mammalian dissection), physiology, human histology, and vertebrate embryology (or developmental anatomy). Course work in sculpture is recommended for applicants interested in prosthetics/3-D model design; course work in computer graphics is recommended for applicants interested in computer visualization; and course work in painting and illustration is recommended for applicants interested in illustration and design.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study and for all cumulative graduate work previously taken.

**Tests Required:** GRE general and writing assessment or GMAT. The score(s) must be from a test administered within five years from the requested date of entry.

**Minimum TOEFL Score:** If the applicant has taken the paper-based TOEFL, minimum scores in the range of 585–600 will be considered; in addition, the applicant must take the Test of Written English and submit scores in the range of 5–6. If the applicant has taken the computer-based TOEFL, minimum scores in the range of 240–250 will be considered. In this case the Test of Written English is not required.

**Letters of Recommendation:** Three required from instructors or employers using Graduate College forms.

**Personal Statement:** The statement should address the applicant's goals for graduate study and career development.

**Other Requirements:** A personal interview and portfolio review with the departmental faculty are required. The portfolio must include 20 slides of representational images in any media, but must include figure drawings and/or paintings. A stamped, self-addressed envelope should be enclosed for the portfolio's return.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 48–50.

### Course Work

**Required Courses:** Anat 441; BHIS 405 and 500; and BVis 400, 405, 410, 415, 420, 430, 440, 450, 460, 480, and 595.

**Electives:** 10 hours from among Anat 414 and BVis 515, 520, 525, 530, 540, 542, 545, 550, 555, 580, 594, and 596.

### Comprehensive Examination

None.

### Thesis, Project, or Course-work-only Options

Thesis or project required. No other options available.

**Thesis:** Students must earn at least 7 hours in BVis 598.

**Project:** Students who complete a project must earn at least 5 hours in BVis 597.

### Other Requirements

**Continuous registration:** students who have completed all degree requirements except the thesis/project must register for zero credit hours to maintain continuous registration.

## Disability and Human Development

*Mailing Address: Department of Disability and Human Development (MC 626), 1640 West Roosevelt Road, Chicago, Illinois 60608-6904*

*Campus Location: 436 IIDD*

*Curriculum Code: 8048*

*Admission Code: 20FS1165MS*

*Telephone: (312) 413-1647*

*E-mail: DHD@uic.edu*

*Head of the Department: Tamar Heller*

*Director of Graduate Studies: Glenn T. Fujiura*

The Department of Disability and Human Development (DHD) offers work leading to the Master of Science in disability and human development. Study and research are available in the specializations of disability studies and social policy and rehabilitation technology.

The department also participates with the Department of Occupational Therapy and Department of Physical Therapy in offering work leading to the Doctor of Philosophy in disability studies. For further information on the Doctor of Philosophy in disability studies, please see the *Disability Studies* section of this catalog.

### Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study. In exceptional cases applicants having a lower GPA may be admitted if they can demonstrate substantial evidence of their ability to complete the program successfully.

**Tests Required:** GRE general with a combined verbal and quantitative score of 1000.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

**Other Requirements:** Applicants must complete all forms included in the department's application packet.

### **Deadlines**

To receive full consideration for fall admission, including consideration for graduate assistantships, applications should be received by March 1 of the year in which admission is being sought.

### **Degree Requirements**

In addition to the minimum requirements of the Graduate College, students must meet the following program requirements:

**Minimum Semester Hours Required:** 36.

#### **Course Work**

This program requires a minimum of 36 semester hours of credit. At least 12 of these 36 hours must be attained in courses at the 500 level. A maximum of 25% of the 36 hours (9 semester hours) may be transferred from accredited and acceptable graduate study at other institutions. Therefore, all students are required to earn a minimum of 27 semester hours of credit in formal course work and thesis/project work within the Master of Science program. Thesis research or thesis project credit may not exceed 40% of the required 36 hours, or a maximum of 14 hours.

**Required Core Courses:** DHD 401 and DHD 415.

**Specialization Courses:** Disability Studies and Social

Policy: Must complete the following two additional courses: DHD 430 and DHD 570.

Rehabilitation Technology: Must complete the following two additional courses: DHD 440 and DHD 551 or 565.

#### **Comprehensive Examination**

A written comprehensive examination is required only for students who do not elect the thesis option.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

**Thesis:** A thesis is strongly recommended for students interested in pursuing careers in scholarship or research. Students electing a thesis must complete either DHD 446 or DHD 515 and at least 8 hours of DHD 598.

**Project:** Students must complete at least 4 hours of DHD 597.

### **Disability Studies**

**Mailing Address:** PhD in Disability Studies Program (MC 626), College of Applied Health Sciences, 1640 West Roosevelt Road, Room 207, Chicago, Illinois 60608

**Campus Location:** 207 IIDD

**Curriculum Code:** 1048

**Admission Code:** 20FS1166PHD

**Telephone:** 996-1508

**E-mail:** mjarman@uic.edu

**Web Site:** www.uic.edu/depts/idhd/DS

**Project Coordinator:** Michelle Jarman

**Director of Graduate Studies:** David T. Mitchell

The Department of Occupational Therapy, the Department of Physical Therapy, and the Department of Disability and Human Development participate in offering an interdisciplinary program leading to the Doctor of Philosophy in disability studies.

### **Admission Requirements**

Applicants will be considered on an individual basis by the Admission Committee for the doctoral program in disability studies. Individuals determined to be deficient in one or more areas may be admitted upon the condition that their deficiencies are remedied through appropriate course work.

All applicants for the program are strongly encouraged to meet one or more faculty members whose research interests most closely match those of the student. The coordinator of the PhD program will arrange such meetings for applicants upon request. (See the telephone number above.)

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** Bachelor's or master's degree in an area relevant to the program.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study and a minimum of 3.00 (A=4.00) for all work beyond the baccalaureate level.

**Test Required:** GRE general with a combined score of at least 1000 for the verbal and quantitative sections.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

### **Degree Requirements**

The disability studies program is designed primarily as a full-time course of study. Students who are full-time will be expected to maintain a course load of three or more classes per semester.

Each student will have an adviser chosen from the faculty of the program. The adviser will monitor the student's progress through the program and serve as the chair for the dissertation committee.

**Minimum Semester Hours Required:** 96 credit hours beyond the baccalaureate degree.

#### **Course Work**

**Required Courses:** Dis 501, 502, 515, 541, and 2 hours of 595. At least 2 additional research courses appropriate to the student's research interests are chosen with an advisor.

**Elective Courses:** 24 semester hours of study in a content area, chosen in consultation with the student's advisor. At least 12 hours must be from within the College of Applied Health Sciences.

#### **Examinations**

**Qualifying Examination:** Required; written.

**Preliminary Examination:** Required.

**Dissertation:** Required. A minimum of 24 semester hours required. The dissertation must be defended at a public session before the dissertation committee and other members of the academic community.

**Other Requirements:** Students entering the program with a baccalaureate degree are required to participate in a research project approved by their advisor. Students entering with a master's degree may have this requirement waived if they have completed equivalent work on a master's thesis.

### **Health Informatics**

**Mailing Address:** Office of Graduate Programs (MC520), School of Biomedical and Health Information Sciences, 1919 West Taylor Street, Chicago, Illinois 60612-7249

**Campus Location:** 250 AHSB

**Curriculum Code:** 9548

**Admission Code:** 20FS1303MS

**Telephone:** (312) 996-6317

**E-mail:** sbhisgrad@uic.edu

**Web Site:** www.sbhis.uic.edu

**Director of Graduate Studies:** Annette L. Valenta

The School of Biomedical and Health Information Sciences (SBHIS) offers work leading to a Master of Science in health informatics. Graduate study in the school prepares students for careers dedicated to improving the generation and management of biomedical and health care data and information through technologies. A certificate in health informatics is available for health care professionals who already have a master's degree. SBHIS also offers the MS in biomedical visualization.

### **Admission Requirements**

Applicants will be considered on an individual basis by the SBHIS Committee on Academic and Educational Policy. Individuals determined to be deficient in one or more areas may be recommended to the Graduate College for admission upon the condition that any deficiencies are remedied

through appropriate course work.

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions. The baccalaureate degree must be consistent with the applicant's chosen area of study and career goals within health informatics. Prior academic work must include a course in basic computing skills (equivalent to BHIS 460) and one course in basic statistics taken within the last five years.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter hours) of undergraduate study and for all cumulative graduate work previously taken.

**Tests Required:** GRE general and writing assessment or GMAT. The score(s) must be from a test administered within five years from the requested date of entry.

**Minimum TOEFL Score:** If the applicant has taken the paper-based TOEFL, minimum scores in the range of 585–600 will be considered; in addition, the applicant must take the Test of Written English and submit scores in the range of 5–6. If the applicant has taken the computer-based TOEFL, minimum scores in the range of 240–250 will be considered. In this case the Test of Written English is not required.

**Letters of Recommendation:** Three required using the Graduate College forms.

**Personal Statement:** Required. The statement should address the applicant's goals for graduate study and career development.

**Other Requirements:** The following prerequisite courses (or equivalent course work or professional experience): HIM 310 and HIM 317.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements.

**Minimum Semester Hours Required:** 45.

#### **Course Work**

Required Courses: BHIS 495, 500, 505, 510, 580, and 595.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Option**

Thesis or project required. No other options available.

**Thesis:** Students must earn at least 8 hours in BHIS 598.

**Project:** Students must earn at least 4 hours in BHIS 597.

#### **Other Requirements**

**Continuous Registration:** Students who have completed all degree requirements except the thesis/project must register for zero credit hours to maintain continuous registration.

## **Human Nutrition**

**Mailing Address:** Department of Human Nutrition (MC 517), 1919 West Taylor Street, Chicago, Illinois 60612-7256

**Campus Location:** 650 AHSB

**Curriculum Code:** 2148

**Admission Codes:** 20FS1326MS (MS); 20FS1326PHD (PhD)

**Telephone:** (312) 996-8055

**E-mail:** nutrition@uic.edu

**Interim Head of the Department:** Alan Diamond

**Director of Graduate Studies:** Alan Diamond

The Department of Human Nutrition offers work leading to degrees at both the master's and doctoral levels. The objective of the program is to train outstanding scholars who will assume research, teaching, and service positions related to human nutrition. Human nutrition is a multidisciplinary field that draws upon and integrates subject matter from a variety of disciplines (e.g., biochemistry, molecular and cell biology, and physiology, as well as epidemiology, physical and cultural

anthropology, sociology, and behavioral psychology). Master's degree study in nutrition as a terminal degree (i.e., not leading to a PhD) is most appropriate for students who wish to apply their nutrition knowledge through practice in health care or industry settings and can be combined, for example, with focused course work in other fields such as public health, kinesiology, toxicology, business, or education. Doctoral studies emphasize nutritional biochemistry, clinical nutrition, and epidemiological studies of nutrition-related health problems in human populations and are designed to lead to academic research and teaching careers or to research careers in government or industry. Active research in the department relates to carotenoids, vitamin B-6 metabolism, nutrition and aging, cancer prevention, mechanisms of nutrient-dependent gene expression, adult and pediatric obesity, AIDS, biomarkers for dietary constituents, clinical nutrition outcomes, and maternal phenylketonuria.

### **Admission Requirements**

Applicants are considered on an individual basis. It should be noted that students needing prerequisites for admission can take these courses as nondegree students. In addition to the Graduate College minimum requirements, applicants must also meet the following program requirements:

**Baccalaureate Field:** Whereas applicants for graduate study in nutrition may come from the entire spectrum of undergraduate fields, or from other health professions such as medicine or nursing, applicants who do not have prior degrees in nutrition, dietetics, food science, or a biological or health sciences field may not meet all course prerequisites without having to take selected additional undergraduate course work. Minimum prerequisites for full admission to graduate study in nutrition can be obtained from the department.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

**Test Required:** GRE general; minimum combined verbal and quantitative score of 1000.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

**Other Requirements:** Candidates for direct admission to PhD study may be asked to submit a sample of their prior published or unpublished written work. Prior work or research experience indicative of the ability for laboratory, clinical, or community-based research will be considered. In addition, exploratory queries and interviews from potential candidates, especially PhD candidates, are welcomed at any time. All applicants for direct admission for PhD study are encouraged to interview in person with the graduate faculty, and such interviews may be required before an admissions decision is made. Contact the department at (312) 996-8055 for more information.

#### **Nondegree Applicants**

Nondegree applicants must submit a transcript from their baccalaureate institution.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

**Minimum Semester Hours Required:** 36 from the baccalaureate.

#### **Course Work**

**Required Courses:** HN 410, 480, 510, and 595; AHS 510; Bstt 400; and Bche 411.

**Electives:** Students must take at least two courses from among HN 420, 422, 461, 514, 515, 520, 522, 525, 530, 531, 532, 535, 570, or 594. The remaining electives may be taken in graduate-level courses in nutrition or other disciplines.



### **Comprehensive Examination**

None.

### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* Students must earn at least 7 hours in HN 598.

### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

*Required Courses:* Bche 460; HN 514, 515, 530, 532, 580, 581, and 595.

*Electives:* Choice of electives should be guided by the subarea of interest, in consultation with advisors.

#### **Examinations**

*Preliminary Examination:* Required. Through written and oral qualifying examinations, all PhD students will be required to demonstrate competency in at least the following three content areas: a) nutrient metabolism (macro and micronutrients), b) nutritional assessment (anthropometry, biochemical, dietary) and c) research design and interpretation.

**Dissertation:** Required. The dissertation will be guided by a committee of HN and other graduate faculty appropriate to the nature of the research project. The format of the dissertation must comply with the UIC Graduate College requirements, as interpreted or expanded by the department.

### **Kinesiology**

*Mailing Address:* School of Kinesiology (MC 194), 901 West Roosevelt Road, Chicago, Illinois 60608-1516

*Campus Location:* 356 PEB

*Curriculum Code:* 2948

*Admission Codes:* 20FS0351MS (MS); 20FS0351PHD (PhD)

*Telephone:* (312) 996-9685

*E-mail:* rstone@uic.edu

*Web Site:* <http://www.kines.uic.edu>

*School Director:* Mark Grabiner

*Director of Graduate Studies:* Charles Walter

The School of Kinesiology offers work leading to degrees in kinesiology at both the master's and doctoral levels. MS candidates pursue course work and research specializing in applied exercise physiology, exercise biology, motor control and learning, or urban youth development. Doctoral students select an emphasis in either exercise biology or motor control and learning. Research opportunities are also available in the area of musculoskeletal biomechanics.

### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### **Master of Science**

**Baccalaureate Field:** No restrictions. Applicants to the specializations in either applied exercise physiology or exercise biology must have completed two semesters of human anatomy and physiology and one semester each of exercise physiology and human biomechanics (kinesiology).

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study and for all graduate work.

**Tests Required:** GRE general, with a minimum combined score of 950 on the quantitative and verbal sections.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required from past professors able to evaluate the applicant's aptitude and potential for graduate study.

**Personal Statement:** 1–2 pages explaining the applicant's career goals and objectives for graduate study.

### **Doctor of Philosophy**

**Prior Degrees:** No restrictions; however, all doctoral applicants must have at least one semester of undergraduate course work in physics and calculus, and applicants to the exercise biology program must have at least one year of biology and organic chemistry.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 3.50 (A=4.00) for any previous graduate work.

**Tests Required:** GRE general with a minimum combined score of 1100 on the quantitative and verbal sections.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required from past professors who can assess the candidate's aptitude and potential to complete doctoral work.

**Personal Statement:** 1–2 pages explaining the applicant's career goals and objectives for graduate study.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

**Minimum Semester Hours Required:** 32.

A 40-hour course-work-only option is also available.

#### **Course Work**

MS students completing a thesis or project will generally take 27 hours of course work and independent research and then earn 5 hours for the thesis or project. Students completing the comprehensive exam and internship will take 29 hours of course work and independent research and earn three hours for the internship experience. Of the course work hours, at least nine must be at the 500 level and at least six must be in cognate areas (in units other than kinesiology). Students who complete the 40-hour course work-only option are required to take at least 18 hours at the 500 level. Forty-hour students must also take Kine 589 Seminar in Kinesiology during their final year of study. All graduate students are required to take Kine 590 Research Methods in Kinesiology. The required courses in each specialization are as follows:

**Exercise Biology—**Kine 521, 523, 529.

**Applied Exercise Physiology—**Kine 403, 420, 421, 428, DHD 520/Kine 540.

**Motor Control and Learning—**Kine 472, 521, 571, 572, PT 574/Kine 574.

**Urban Youth Development—**Kine 415, 416 or 515, 517. Remaining hours can be met by kinesiology electives, cognates, or independent research projects. Grades lower than B in specialization courses will not be counted toward the degree. Students who receive more than two grades lower than B will be dropped from the program.

#### **Comprehensive Examination**

The comprehensive examination is only required of (and only available to) students in the examination/internship option of the MS specialization in applied exercise physiology.

#### **Thesis, Project, or Course-work-only Options (with and without internship)**

**Thesis:** Recommended for students in the basic science programs (exercise biology and motor control and learning) and urban youth development. A minimum of 5 hours of Kine 598 is required; generally, 6 hours are taken.

**Project:** Recommended for students in applied exercise physiology. A minimum of 5 hours of Kine 597 is required; generally, 6 hours are taken.

**Course Work:** 40 hours course work only or 32 hours course work and examination/internship (see above).



## **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96.

### **Course Work**

**Required Courses:** Kine 521, 522, 590, 591, 599, and a statistics course to be determined in consultation with the advisor.

Additionally, Kine 523 and 529 are required for the exercise biology specialization, and Kine 472, 571, 572, and 574 are required for the motor control and learning specialization.

**Electives:** Students in the exercise biology specialization must take a minimum of 12 semester hours of course work in areas determined in consultation with their research advisor. Students in the motor control and learning specialization must take a minimum of 9 semester hours of elective course work in areas determined in consultation with their research advisor.

### **Examinations**

1. Preliminary Exam.
2. Dissertation proposal.
3. Dissertation defense.

### **Dissertation**

Required.

### **Other Requirements**

All PhD students must participate in the teaching program of the School of Kinesiology.

## **Occupational Therapy**

**Mailing Address:** Department of Occupational Therapy (MC 811), 1919 West Taylor Street, Chicago, Illinois 60612-7250

**Campus Location:** 311 AHSB

**Curriculum Codes:** Postprofessional (5448);

Professional/Entry-Level Master's (6048)

**Admission Codes:** 20FS1511MS (Postprofessional);

20FS1510MS (Professional)

**Telephone:** (312) 996-6901

**E-mail:** OTDept@uic.edu

**Head of the Department:** Gary Kielhofner

**Director of Graduate Studies:** Gary Kielhofner

The Department of Occupational Therapy offers a program leading to the postprofessional degree for students who are occupational therapists and who desire an advanced degree, as well as a professional Master of Science degree for students who have a bachelor's degree in another area. Students may focus on an area of clinical practice specialization (pediatrics, psychosocial, gerontology, physical disabilities) or on a role such as management and public policy, private practice, school system therapy, clinical education, or clinical research. Students may elect (upon faculty approval) either a scholarship of discovery (research track) or scholarship of application (project track).

Please refer to the "Disability Studies" entry for a description of the PhD in disability studies jointly offered through the Departments of Occupational Therapy, Physical Therapy, and Disability and Human Development.

### **Admission Requirements**

#### **Postprofessional Master's Degree**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** Applicants must have completed an occupational therapy education program at a school approved by the World Federation of Occupational Therapy and have a bachelor's degree in occupational therapy (or another field, for international applicants with certification in occupational therapy but without a bachelor's degree in occupational therapy). Applicants must have completed one course in statistics.

**Grade Point Average:** At least 3.00 (A=4.00) calculated on the last 60 semester (90 quarter) hours toward the first bachelor's degree and subsequent course work.

**Tests Required:** GRE general; combined verbal and quantitative scores should be at least 1000.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

Applicants who do not meet the GPA or GRE requirements, but who demonstrate strengths in other areas, may be considered.

#### **Professional Master's Degree (Entry-Level Degree)**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** Any field, no restrictions.

Baccalaureate degree in any field plus completion of the following prerequisites with a grade of C or above prior to enrollment: one course in anthropology or sociology (equivalent to Anth 101 or Soc 100); two courses in psychology (child psychology or child development\* [equivalent to Psch 320] and abnormal psychology [equivalent to Psch 270]); one course in statistics (equivalent to Psch 343); one course in human physiology\*, with laboratory, covering all structures and functions of the body (minimum of four semester hours); and one course in human anatomy\* with laboratory (laboratory with 30 hours of human cadaver lab study required) (minimum of four semester hours) (a two-course sequence in human anatomy and physiology is acceptable if it includes the cadaver laboratory [equivalent to Kine 251 and 252]).

\*These courses must be taken within five years prior to admission to the department.

**Grade Point Average:** At least 3.00 (A=4.00) calculated on the last 60 semester (90 quarter) hours toward the first bachelor's degree and subsequent course work.

**Tests Required:** GRE general; combined verbal and quantitative scores should be at least 1000. GRE writing assessment; no minimum score is required.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

Applicants who do not meet the GPA or GRE requirements, but who demonstrate strengths in other areas, may be considered.

### **Degree Requirements**

#### **Postprofessional Master's Degree**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 36.

#### **Course Work**

**Required Courses:** AHS 510; OT 500 and 595.

**Electives:** Students must take either a research elective (3–4 hours) or a scholarship of practice elective (3–4 hours) chosen in consultation with an advisor. At least one course must be taken in the department.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

**Thesis:** Thesis students must earn at least 8 hours in OT 598.

**Project:** Project students must earn at least 4 hours, but no more than 8 hours, in OT 597. If fewer than 8 hours in project option are taken, additional electives are required to acquire semester hours for graduation.

### **Professional Master's Degree (Entry-Level Degree)**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 36.

#### **Course Work**

In order to qualify for certification as an occupational therapist, students in the professional degree program must elect clinical courses beyond the 36 credits required for graduation. Contact the Department of Occupational Therapy for more information on these required courses.

*Required Courses:* OT 500, 510, and 595.

The professional master's degree has been fully accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA). It is located at 4720 Montgomery Lane, P.O. Box 31220, Bethesda, MD 20824-1220. AOTA's telephone number is (301) 652-AOTA. They also maintain a Web site at [www.aota.org](http://www.aota.org).

UIC graduates are able to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the individual will be an occupational therapist, registered. Most states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT certification examination. A felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

*Thesis:* Thesis students must earn at least 8 hours in OT 598.

*Project:* Project students must earn at least 4 hours, but no more than 8 hours, in OT 597.

### **Physical Therapy**

*Mailing Address:* Department of Physical Therapy (MC 898), 1919 West Taylor Street, Chicago, Illinois 60612-7251

*Campus Location:* 448 AHSB

*Curriculum Code:* 9648

*Admission Code:* 20FS1582MS

*Telephone:* (312) 996-1504

*E-mail:* [zhasan@uic.edu](mailto:zhasan@uic.edu)

*Head of the Department:* Suzann Campbell

*Director of Graduate Studies:* Ziaul Hasan

The Department of Physical Therapy offers work leading to the Master of Science in physical therapy. Graduate study in physical therapy involves the investigation of questions related to how the body moves, how simple and complex motor skills are acquired and executed, and how therapeutic physical activity produces effects on physical performance under normal or abnormal neuromusculoskeletal conditions.

Research in the field can be either basic or applied to practical clinical problems and consequences of physical performance deficits on function and disability. Research areas include movement science, pediatrics, adult neurology, and rehabilitation.

Please refer to the "Disability Studies" entry for a description of the PhD in disability studies jointly offered through the Departments of Occupational Therapy, Physical Therapy, and Disability and Human Development.

### **Admission Requirements**

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Prior Degrees:* Entry-level professional degree in physical therapy.

*Grade Point Average:* At least 3.00 (A=4.00).

*Tests Required:* GRE general. Applicants should have a combined verbal and quantitative score of at least 1000.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three professional references are required.

*Personal Statement:* Required. The statement should address the applicant's goals for graduate study and career development.

*Other Requirements:* Licensure to practice physical therapy (or eligibility for American Physical Therapy Association membership, if foreign-trained). Preference will be given to applicants with clinical experience beyond their professional degree.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 36.

#### **Course Work**

At least 12 hours must be at the 500 level. At least 12 hours must be in physical therapy. Students receiving 3 or more grades of C will be dismissed from the program.

*Required Courses:* A graduate-level statistics course (e.g., Soc 401 or Bstt 502); a research methods course (e.g., AHS 510 or NuSc 515); PT 501; and a movement science course from the following list: PT 510, 571, 572 (the last two are cross-listed as Kine 571 and 572). A student registered full-time must take PT 595.

*Electives:* Choice of electives should be guided by the area of interest, in consultation with the advisor.

#### **Comprehensive Examination**

Required; written.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* Students must earn at least 6 hours in PT 598.

#### **Other Requirements**

Students must complete at least one semester of full-time residency.

# College of Architecture and the Arts

## Architecture

*Mailing Address: School of Architecture (MC 030), 845 West Harrison Street, Chicago, Illinois 60607-7024*

*Campus Location: 3100 A&A*

*Curriculum Code: 0524*

*Admission Code: 20FS0249MARC*

*Telephone: (312) 996-7962*

*E-mail: noreen@uic.edu*

*Acting Director, School of Architecture: Douglas Garofalo*

*Director of Graduate Studies: Douglas Garofalo*

The School of Architecture offers graduate programs leading to the Master of Architecture degree as both the first and second professional degree. The one-year option is designed for holders of a first professional degree in architecture. The three-year-with-advanced-standing option is designed for holders of a four-year professional degree in architectural studies. The three-year graduate program is designed for holders of degrees in fields other than architecture.

### Admission Requirements

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work in a university-level course in differential and integral calculus offered through a mathematics department is highly recommended. Applicants must have a basic understanding of algebra, geometry, and trigonometry.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from individuals acquainted with the applicant's recent academic, professional, or creative work.

*Personal Statement:* Required; 500 words; the statement should address the relationship of this advanced training to the applicant's personal and professional objectives.

*Other Requirements:* Applicants for admission to the one-year and three-years-with-advanced-standing options must submit a portfolio with examples of their creative and/or professional work. Professional work should be separated from original work. Option III with Advanced Standing: acceptance into the program requires the prior completion of calculus I, introduction to computers in architecture, statics and strength of materials, one year of the history of architecture, one year of architectural design studio, and one year of building science. Acceptance requires a portfolio review and evaluation of previous course work. Applicants to the three year option are required to submit a portfolio of current creative work that does not need to be strictly architectural: for example, photographs, 3-D work, drawing, computer visualizations, writing, installations.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

### Degree Requirements

The requirements for the degree vary according to the student's previous studies and level of preparation. The Graduate Admissions Committee of the school will specify, at the time of admission, the option to which each student has been accepted. In addition to the Graduate College

minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 32 to 112, depending on the student's level of preparation.

### Course Work

At least 24 hours must be at the 500 level in architecture.

*Required Courses:* One-year option: 16 hours of architectural design, 8 hours of architectural theory, and at least 8 hours of electives.

Three-year-with-advanced-standing option—Arch 410, 411, 443, 444, 453, 454, 463, 464, 473, 474, 554, 555; 12 hours of architectural electives; and 4 hours of free electives.

*Portfolio review occurs after 1st year.*

Three-year option—Arch 430, 442, 443, 444, 451, 452, 453, 454, 461, 462, 463, 464, 472, 473, 474, 485, 551, 552; AH 420 and 421; one art history elective; and 12 hours of architecture electives.

*Portfolio review occurs after 1st and 2nd years.*

### Comprehensive Examination

None.

### Thesis, Project, or Course-work-only Options

Course work only. No other options available.

## Art History

*Mailing Address: Department of Art History (MC 201), 935 West Harrison Street, Chicago, Illinois 60607-7039*

*Campus Location: 302 HH*

*Curriculum Code: 0924 (MA), 2024 (PhD)*

*Admission Codes: 20FS0250MA (MA); 20FS0250PHD (PhD)*

*Telephone: (312) 996-3303*

*E-mail: susl@uic.edu*

*Web site: <http://www.uic.edu/depts/arch/ah>*

*Chairperson, Department of Art History: David Sokol*

*Director of Graduate Studies: Martha Pollak*

The Department of Art History offers work leading to degrees at both the master's and doctoral levels.

The Master of Arts in art history offers study and research in the general areas of the history of architecture and art.

The PhD in art history is designed to promote intellectual inquiry and provide professional-level training in the discipline, in a program that provides both wide coverage and particular depth in two broad areas of unusual and exceptional faculty strengths. In addition, there is the possibility of combining and blending course work and research in those areas in a direct interdisciplinary program. These two areas, which encompass the entire faculty, are the history of art of the Americas and the history of architecture, design, and urbanism.

### Admission Requirements

#### Master of Arts

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 650 (paper-based); 280 (computer-based).

*Letters of Recommendation:* Three required from faculty members or others familiar with the applicant's training, ability, and experience.

*Personal Statement:* Applicants must submit a short statement of purpose.

### **Application Deadlines**

January 1 for applicants who wish to be considered for financial aid from the department and April 15 for all other applicants.

### **Doctor of Philosophy**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Previous Degrees:* Completion of a Master of Arts program in art history or equivalent is required for admission to the PhD program. However, exceptional students may be admitted directly to the PhD program with a bachelor's degree, completing the requisite 96 semester credits of courses and the other requirements of the degree, without completing an MA. Students originally accepted in the department for the MA who wish to continue on to the doctorate must satisfy the department's Master of Arts degree requirements and be recommended by the department for further work. Doctoral applicants who have a Master of Arts degree in a related field may be accepted directly into the doctoral program with the transfer of up to 32 credits toward the doctorate. Examples of appropriate related degrees include: MArch, the MFA in art, and the MA in such humanities areas as history, philosophy, or literature.

*Grade Point Average:* At least 3.00 (A=4.00) in an appropriate MA from another institution; if applying with a BA, the applicant must have a 3.20 overall and a 3.50 in the major, or approval by the Graduate Program Committee.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 650 (paper-based); 280 (computer-based).

*Letters of Recommendation:* Three required, preferably from professors and others who are familiar with the applicant's potential for serious academic work.

*Personal Statement:* Applicants must submit a short statement of purpose that should address his or her reasons for wishing to do doctoral work and the relationship of this work to his or her professional and career objectives.

### **Application Deadlines**

January 1 for applicants who wish to be considered for financial aid from the department and April 15 for all other applicants.

## **Degree Requirements**

### **Master of Arts**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 40.

### **Course Work**

At least 16 hours must be at the 500 level.

*Required Courses:* AH 510, 511. Teaching assistants are also required to take AH 512.

*Comprehensive Examination:* Required.

### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* No more than 8 hours of AH 598 can be applied to the degree.

*Course Work Only:* Students who do not write a thesis must submit two substantial research papers written in conjunction with graduate courses taken in the Department of Art History to the departmental Graduate Program Committee. No additional credit is granted for the completion of these papers.

### **Doctor of Philosophy**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 96 semester hours beyond the bachelor's degree.

### **Course Work**

Candidates must complete at least 64 semester hours of course work beyond the master's degree. Of this amount, 32 semester hours must be in graduate seminars, of which 18 semester hours must be taken in the department. At least 32 semester hours of credit beyond the MA degree must be at the 500 level. Of the 64 semester hours required beyond the master's degree, a maximum of 24 semester hours of dissertation research are allowed.

*Required Core Courses:* AH 510 and 511 are required of all students who enter the PhD program with an MA from another institution.

Areas of specialization include:

Art of the Americas—AH 562; 16 hours in seminars AH 460, 463, 464, 470, 530, 560, 561, 563, 570; and directed reading courses in the area of concentration, as approved by the director of graduate studies.

Architecture, Design, and Urbanism—AH 522; 16 hours in seminars AH 541, 550, 560, 561, 563, 570; and directed reading courses in the area of concentration, as approved by the director of graduate studies.

Students who have taken equivalent course work as part of an MA degree may petition the director of graduate studies for a waiver of specific requirements; no course credit is given for a waived course.

*Foreign Language Requirements:* Students must present evidence, usually by a proficiency examination, of advanced knowledge of a language other than English as it relates to the student's chosen area of research. Evidence of the ability to pursue research in additional languages may be necessary, depending on the availability of literature in the field selected, and the selection of those languages must be approved by the student's advisor.

*Preliminary Examination:* Required; written and oral, to be taken upon completion of the course work and satisfaction of the language requirement. The written examination will cover the area of specialization; the oral examination will be based on the written sections and the dissertation prospectus submitted by the candidate.

*Dissertation:* Required; the dissertation will make a contribution to knowledge in art history and will be publicly defended before the scholarly community.

*Grade-Point-Average Requirements:* Students must maintain a minimum grade point average of 3.00. No credit will be given for a course taken as part of the doctoral program in which the grade earned was less than a B.

## **Art Therapy**

*Mailing Address:* School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038

*Campus Location:* 106 JH

*Admission Code:* 20FS1044MA

*Curriculum Code:* 0724

*Telephone:* (312) 996-3337

*E-mail:* bosbo@uic.edu

*Acting Director, School of Art and Design:* Rodney Carswell

*Director of Graduate Studies:* Klindt Houlberg

*Coordinator of Art Therapy Program:* Harriet Wadeson

The School of Art and Design offers a program leading to the Master of Arts in art therapy. The program has been approved by the American Art Therapy Association as meeting its Guidelines for Education and Training; as such it prepares graduates for registration (ATR) and board certification (ATR-BC) by the association. The program is also in compliance with Illinois licensure training requirement; as such, it prepares graduates for the Licensed Clinical Professional Counselors credential (LCPC). The



School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

The School of Art and Design also offers programs leading to the Master of Fine Arts degree in electronic visualization, film/animation/video, graphic design, industrial design, photography, and studio arts. Consult the appropriate chapters in this catalog for more information on these programs.

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Psychology, art, education, or social work. Prior academic work should include 20 semester hours in studio art, including drawing, painting, and 3D (or the equivalent) and 12 semester hours in psychology, including a course in abnormal psychology and a course in developmental psychology.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* Miller Analogies Test (MAT).

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. This statement of purpose should address the applicant's reasons for studying art therapy and selecting this university.

*Other Requirements:* Applicants must submit a portfolio of 12 to 15 slides of current visual artwork in a slide sheet. The school is not responsible for submissions of original work. An interview is required; the art therapy program will notify qualified applicants. It is highly recommended that applicants have experience in a special school or treatment facility. Fall admission only.

#### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

*Note* The MA in art therapy program will admit students in alternate years beginning with the fall 2003 term.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 63.

#### **Course Work**

*Required Courses:* AD 550, 551, 552, 553, 555, 556, 557, 558, 581, 582, 583, and 598 and SocW 535 and 540. AD 555 must be repeated for a total of 12 semester hours. AD 598 must be repeated for a total of 8 semester hours.

*Electives:* 12 hours from courses in related fields.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* Students must earn at least 8 semester hours in AD 598; no more than 8 hours of AD 598 can be applied to the degree. The candidate will present documentation of the presentation to the school for archival purposes.

### **Electronic Visualization**

*Mailing Address:* School of Art and Design ( MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038

*Campus Location:* 106 JH

*Curriculum Code:* 1124

*Admission Code:* 20FS1205MFA

*Telephone:* (312) 996-3337

*E-mail:* bosbo@uic.edu

*Acting Director, School of Art and Design:* Rodney Carswell

*Director of Graduate Studies:* Klindt Houlberg

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in electronic visualization. The school also offers programs leading to the MFA degree in film/animation/video, graphic design, industrial design, photography, and studio arts, and a program leading to the Master of Arts degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions; however, individuals who apply must demonstrate an advanced level of competence in electronic visualization through their portfolio submission.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. This statement of purpose should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you would like to study in the chosen area in our school.

*Other Requirements:* Applicants must submit a portfolio of visual work demonstrating proficiency in the area of computer graphics, video, and/or electronic visualization. The portfolio may be submitted as CD-ROM (PC-compatible), 3/4" U-matic or VHS video, and 12 to 15 slides of representative work. The school is not responsible for submissions of original work. Experience in time-based media (video or film), computer graphics programming (C, C++, GL, Open GL), or mathematics may be required prior to entrance. Site visitation with area coordinators is encouraged.

#### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 64.

#### **Course Work**

*Required Courses:* 16 semester hours of AD 502. At least 48 semester hours must be in the area of specialization and must include at least 36 semester hours at the 500 level.

*Electives:* At least 12 semester hours of graduate-level electives are required. The completion of at least two courses in art history is strongly recommended.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

*Project:* All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.



### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

### **Film/Animation/Video**

*Mailing Address: School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1724*

*Admission Code: 20FS1257MFA*

*Telephone: (312) 996-3337*

*E-mail: bosbo@uic.edu*

*Acting Director, School of Art and Design: Rodney Carswell*

*Director of Graduate Studies: Klindt Houlberg*

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in film/animation/video. The school also offers programs leading to the MFA degree in electronic visualization, graphic design, industrial design, photography, and studio arts, and a program leading to the MA degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions; however, individuals who apply must demonstrate an advanced level of competence in film/animation/video through their portfolio submission.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. This personal statement should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you would like to study in your chosen area in our school.

*Other Requirements:* Applicants must submit a portfolio of visual work demonstrating proficiency in the area of film/animation/video. The portfolio may be submitted on CD-ROM (PC-compatible), 1/2" or 3/4" NTSC or VHS video, or 16 mm film (which may have separate magnetic audio track). The school is not responsible for submissions of original work. Site visitation with area coordinators is encouraged.

### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 64.

### **Course Work**

*Required Courses:* 16 hours of AD 502, 16 hours of AD 570, and 20 hours of AD 571.

*Electives:* At least 12 semester hours of graduate-level electives are required. The completion of at least two courses in art history is strongly recommended.

### **Comprehensive Examination**

None.

### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

*Project:* All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.

### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

### **Graphic Design**

*Mailing Address: School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1224*

*Admission Code: 20FS0148MFA*

*Telephone: (312) 996-3337*

*E-mail: bosbo@uic.edu*

*Acting Director, School of Art and Design: Rodney Carswell*

*Director of Graduate Studies: Klindt Houlberg*

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in graphic design. The school also offers programs leading to the MFA degree in electronic visualization, film/animation/video, Industrial design, photography, and studio arts, and a program leading to the MA degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions; however, individuals who apply must demonstrate an advanced level of competence in graphic design through their portfolio submission.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required; this statement of purpose should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you choose to study in a research-oriented design program.

*Other Requirements:* Applicants must submit a portfolio of 12 to 15 slides of current work demonstrating proficiency in the area of graphic design. Competence and understanding of design-related computer technology, including proficiency in QuarkXPress, Adobe Illustrator and Adobe Photoshop are recommended. Prerequisites and/or technical experience specific to this field of study may be required prior to entrance. Site visitation with area coordinators is encouraged. The school is not responsible for submissions of original work.

### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 64.

#### **Course Work**

**Required Courses:** 16 hours of AD 502, 16 hours of AD 510, and 20 hours of AD 511.

**Electives:** At least 12 semester hours of graduate-level electives are required. The completion of at least two courses in art history is strongly recommended.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

**Project:** All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.

#### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

### **Industrial Design**

**Mailing Address:** School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038

**Campus Location:** 106 JH

**Curriculum Code:** 1324

**Telephone:** (312) 996-3337

**E-mail:** bosbo@uic.edu

**Acting Director, School of Art and Design:** Rodney Carswell

**Director of Graduate Studies:** Klindt Houlberg

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in industrial design. The school also offers programs leading to the MFA degree in electronic visualization, film/animation/video, graphic design, photography, and studio arts, and a program leading to the MA degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Until further notice, no new students will be admitted to this program. Contact the program directly for details.

Applicants are considered on an individual basis.

Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions; however, individuals who apply must demonstrate an advanced level of competence in industrial design through their portfolio submission.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 580 (paper-based); 237 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required. This statement of purpose should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you would like to study in your chosen area in our school.

**Other Requirements:** Applicants must submit a portfolio of 12 to 15 slides or CD-ROM (PC- or Mac-compatible) of current work demonstrating proficiency in the area of industrial design. The school is not responsible for submissions of original work. Students who lack competence in computer-aided design will be required to take remedial work. Prerequisites and/or technical experience specific to this field of study may be required prior to entrance. Site visitation with area coordinators is encouraged.

#### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 64.

#### **Course Work**

**Required Courses:** 16 hours of AD 502, 16 hours of AD 520, and 20 hours of AD 521.

**Electives:** At least 12 semester hours of graduate-level electives are required. The completion of at least two courses in art history is strongly recommended.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

**Project:** All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.

#### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

### **Photography**

**Mailing Address:** School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038

**Campus Location:** 106 JH

**Curriculum Code:** 1524

**Admission Code:** 20FS0151MFA

**Telephone:** (312) 996-3337

**E-mail:** bosbo@uic.edu

**Acting Director, School of Art and Design:** Rodney Carswell

**Director of Graduate Studies:** Klindt Houlberg

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in photography. The school also offers programs leading to the MFA degree in electronic visualization, film/animation/video, graphic design, industrial design, and studio arts, and a program leading to the Master of Arts degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions; however, individuals who apply must demonstrate an advanced level of competence in photography through their portfolio submission.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. This statement of purpose should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you would like to study in your chosen area in our school.

*Other Requirements:* Applicants must submit a portfolio of 12 to 15 slides or CD-ROM (Mac-compatible) of current work demonstrating proficiency in the area of photography. The school will not be responsible for submissions of original work. Prerequisites and/or technical experience specific to this field of study may be required prior to entrance. Site visitation with area coordinators is encouraged.

#### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 64.

#### **Course Work**

*Required Courses:* 16 semester hours of AD 502, 16 semester hours of AD 560, and 20 semester hours of AD 561.

*Electives:* At least 12 semester hours of graduate-level electives are required. The completion of at least two courses in art history is strongly recommended.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

*Project:* All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.

#### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

### **Studio Arts**

*Mailing Address:* School of Art and Design (MC 036), 929 West Harrison Street, Chicago, Illinois 60607-7038

*Campus Location:* 106 JH

*Curriculum Code:* 1924

*Admission Code:* 20FS1715MFA

*Telephone:* (312) 996-3337

*E-mail:* bosbo@uic.edu

*Acting Director, School of Art and Design:* Rodney Carswell

*Director of Graduate Studies:* Klindt Houlberg

The School of Art and Design offers work leading to the Master of Fine Arts (MFA) degree in studio arts. The school also offers programs leading to the MFA degree in electronic visualization, film/animation/video, graphic design, industrial design, and photography, and a program leading to the Master of Arts degree in art therapy. Consult the appropriate chapters in this catalog for more information on these programs. The School of Art and Design is an accredited institutional member of the National Association of Schools of Art and Design (NASAD).

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions; however, individuals who apply must demonstrate an advanced level of competence in studio arts (painting, sculpture, printmaking) through their portfolio submission.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required; this statement of purpose should outline your current or previous work as relevant to your plans and objectives for advanced study; describe professional goals and how these goals were developed; and state why you would like to study in your chosen area in our school.

*Other Requirements:* Applicants must submit up to 12 slides as a portfolio of visual work demonstrating proficiency in the area of studio arts. An optional additional portfolio may include video/audio submissions. The school is not responsible for submissions of original work. Prerequisites and/or technical experience specific to this field may be required prior to entrance. Site visitation with area coordinators is encouraged.

#### **Deadlines**

The application deadline for this program is February 1; contact the School of Art and Design for more information.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 64.

#### **Course Work**

*Required Courses:* 16 semester hours of AD 502, 16 semester hours of AD 530, and 20 semester hours of AD 531.

*Electives:* At least 12 semester hours of graduate-level electives are required. The completion of two courses in art history is strongly recommended.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only options**

Project required. No other options available.

*Project:* All MFA candidates must present for review a public exhibition or showing. Documentation in the form of a major paper and slides of the project must be presented to the school for archival purposes.

#### **Other Requirements**

Continuation in the MFA program beyond the first 32 semester hours requires an evaluation and recommendation of the graduate advisory committee in the student's area.

## College of Business Administration

The College of Business Administration also offers a program leading to the Master of Business Administration degree. This professional program is not part of the Graduate College. Contact the Graduate Business Program office for more information on the MBA program at (312) 996-4573 or mba@uic.edu.

### Accounting

*Mailing Address: Department of Accounting (MC 075), 601 South Morgan Street, Chicago, Illinois 60607-7122*

*Campus Location: 2331 UH*

*Curriculum Code: 0317*

*Admission Code: 20FS1000MS*

*Telephone: (312) 996-4751*

*E-mail: agrosi@uic.edu*

*Head of the Department of Accounting: Ronald Picur*

*Director of Graduate Studies: Thomas Omer*

The Department of Accounting offers work leading to the Master of Science in accounting degree and participates with the Graduate Business Program in the MBA/MS (accounting) joint degree program.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### Master of Science

Applicants are considered on an individual basis. Transcripts for all undergraduate and any graduate work must be submitted.

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study. Applicants possessing a master's degree in business or an equivalent degree from a program accredited by the American Assembly of Collegiate Schools of Business (AACSB) must have maintained a grade point average of at least 3.00 (A=4.00) in that program.

*Tests Required:* GMAT.

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).

*Letters of Recommendation:* Two required.

*Personal Statement:* Required.

*Other Requirements:* Fall admission is preferred.

#### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

#### MBA/MS (Accounting)

Applicants to the joint degree program must satisfy the admission requirements of both the MBA and MS programs. In addition to the requirements listed above for the MS program, applicants must have taken one course in computer programming (any higher-level language) and mathematics through the level of calculus (covering integration and differentiation). Administration and application procedures are handled by the Graduate Business Programs office.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 32.

#### Course Work

Degree candidates must present a cumulative grade point average of at least 3.00 (A=4.00) for all course work, including background (foundation) courses.

*Required Courses:* Actg 515 and 593 and six concentration courses (one core course and five electives) selected in consultation with an advisor. The areas of concentration are financial accounting, managerial accounting, auditing, international accounting, taxation, and governmental accounting.

Students with undergraduate degrees in fields other than accounting must also take Actg 335, 474, 500, 502, 503, 506, and 508; and IDS 531 or the equivalent. Exemption from background requirements is awarded based on completion of satisfactory equivalent study.

*Electives:* As part of their area of concentration and in consultation with their advisor, students will select five electives to complete the degree requirements. Electives will be selected from the following areas: accounting, College of Business Administration courses, and nonbusiness courses offered by colleges other than the College of Business Administration.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Course work only. No other options available.

#### MBA/MS (Accounting)

*Minimum Semester Hours Required:* 68.

#### Course Work

Students must maintain a cumulative grade point average of at least 3.00 (A=4.00) for all course work, including background courses.

*Required Courses:* Actg 515, Actg 593, and either Actg 465, 484, 516, 525, 535, or 545; Econ 520; Fin 500; IDS 532; Mgmt 541; Mktg 500; a three-course concentration within the MBA program, excluding accounting; a five-course concentration within the MS program chosen in consultation with an advisor; and one 500-level business course from a department other than accounting and the MBA concentration field. No more than two 400-level courses can be counted toward the MS portion of the degree.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Course work only. No other options available.

## Business Administration PhD

*Mailing Address: Business Doctoral Studies (MC 075), 601 S. Morgan Street, Chicago, Illinois 60607-7122*

*Campus Location: 2331 UH*

*Curriculum Code: 1117*

*Admission Code: 20FS0079PHD*

*Telephone: (312) 996-4751*

*E-mail: gradbus@uic.edu*

*Director of PhD Program: John McDonald*

The doctoral program is designed to produce scholars and practitioners who are well qualified to conduct creative and significant research in business studies. Currently, four areas of inquiry are available: business economics, finance, human resource management, and marketing. Students will either select one of these areas or pursue unique interests in a course of study that is custom designed by business school faculty.

### Admission Requirements

Admission is competitive. The Doctoral Studies Programs Office has its own application packets and procedures; all application materials, including transcripts and fees, must be submitted directly to this office. Transcripts for all undergraduate and any graduate work must be submitted in a signed, sealed envelope. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:



*Baccalaureate Field:* No restrictions. Prior academic work should include mathematics/statistics, computing/analysis, and business.

*Grade Point Average:* At least 2.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GMAT or GRE. The score must be from a test administered within five years from the requested date of entry. The writing assessment is required.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the intellectual skills, perseverance, and integrity of the applicant. At least one recommendation should be from an academic familiar with the applicant's work.

*Personal Statement:* Required. 500 words. The statement should address the applicant's interests and qualifications, including research interests and the impact this work is expected to have on the applicant's career.

*Other Requirements:* Interviews with the faculty in the field of the degree, the PhD coordinator, the director of doctoral studies, and the department head are advised.

Students are admitted only in the fall semester.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Business Administration's Doctoral Studies Programs Office for information on current deadlines.

#### **Degree Requirements**

*Minimum Semester Hours Required:* 96 from the baccalaureate, 64 from the MBA.

#### **Course Work**

The first year of study will include a two-course requirement in mathematics, statistics, or computing; a four-course breadth requirement (four MBA core courses, no two of which are from the same functional area and none of which are from the area of inquiry); and a six-course depth requirement (advanced courses, at least two of which are sufficiently rigorous to provide the basis for the qualifying exam). Following the qualifying exam, additional course requirements are determined by the student's advisor.

*Required Courses:* Any two from among Econ 504, IDS 527, Mgmt 581 and 582, Mktg 571, Phil 517 and 521, PolS 500, or PPA 500; plus at least 8 hours of research methodology in the student's degree area. Additional required courses vary by degree area; contact the Doctoral Studies Program Office for information on the specific requirements of each area.

#### **Examinations**

*Qualifying Examination:* A written exam, based upon courses used for the student's depth requirement, is required and will be administered by faculty in the student's area of inquiry.

*Preliminary Examination:* A written and/or oral exam addressing advanced material in the area of inquiry and/or the student's plans for dissertation research is required.

#### **Dissertation**

A dissertation demonstrating the ability to conduct original, scholarly research is required. No more than 32 hours of doctoral thesis research can be applied to the degree.

#### **Other Requirements**

Students must serve as a teaching assistant or research assistant. This requirement may be waived for students with appropriate teaching or research experience.

#### **Economics**

*Mailing Address:* Department of Economics (MC 144), 601 South Morgan Street, Chicago, Illinois 60607-7121

*Campus Location:* 2103 UH

*Curriculum Codes:* 1417 (MA), 1517 (PhD)

*Admission Codes:* 20FS0074MA (MA); 20FS0074PHD (PhD)

*Telephone:* (312) 996-2683

*E-mail:* econ@Lx1.econ.uic.edu

*Head of the Department:* Barry R. Chiswick

*Director of Graduate Studies:* Paul J. Pieper

The Department of Economics offers work leading to the Master of Arts in economics and the Doctor of Philosophy in economics. The department also participates with the MBA program in offering the MBA/MA (economics) joint degree program. In addition, the business administration doctoral program offers a specialization in business economics; consult the appropriate chapter in this catalog for more information.

#### **Admission Requirements**

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

##### **Master of Arts and Doctor of Philosophy**

Applicants are considered on an individual basis.

Transcripts from all colleges and universities attended in the last eight years must be submitted.

*Baccalaureate Field:* An undergraduate degree in economics is desirable but not required. Prior academic work should include introductory calculus, statistics, intermediate microeconomic theory, and intermediate macroeconomic theory.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE or GMAT.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

##### **MBA/MA (Economics)**

Prospective students for the joint degree program must apply and be admitted to both programs. All application materials should be submitted to the MBA Program office.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

##### **Master of Arts**

*Minimum Semester Hours Required:* 40.

#### **Course Work**

At least 32 hours must be in economics, of which at least 28 hours must be at the 500 level, excluding Econ 592, 596, 597, and 598. No more than 12 hours total of Econ 592, 596, 597, and 598 can be applied to the degree. Econ 441, 520, 540, 541, and 599 cannot be used to satisfy any MA requirement.

*Required Courses:* Econ 501, 502, 511, 512, 534, and 535. All students must complete the four courses in economic theory (Econ 501, 502, 511, and 512) with a grade point average in these four courses of at least 3.00. Credit will be given for at most one grade of C in any of these courses.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* No more than 8 hours of Econ 598 can be applied to the degree.

*Course Work Only:* Students who do not write a thesis must enroll in Econ 592 or 596 for 4 hours of credit, and



write an acceptable paper for the course.

### **MBA/MA (Economics)**

**Minimum Semester Hours Required:** 72.

#### **Course Work**

No more than 12 hours total of Econ 592, 596, 597, and 598 can be applied to the degree.

**Required Courses:** Actg 500; Econ 501, 502, 511, 512, 534, 535; Fin 500; IDS 532; Mgmt 541; and Mktg 500. All students must complete the four courses in economic theory (Econ 501, 502, 511, and 512) with a grade point average in these four courses of at least 34.00. Credit will be given for at most one grade of C in any of these courses.

**Electives:** 12 additional hours in economics at the 500 level (excluding Econ 520, 521, 540, 541, 593, and 599) and 16 additional hours of 500-level courses in at least two other disciplines within the College of Business Administration except economics.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

**Thesis:** No more than 8 hours of Econ 598 can be applied to the degree.

**Course Work Only:** Students who do not write a thesis must enroll in Econ 592 or 596 for 4 hours of credit, and write an acceptable research paper for the course.

### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 104 from the baccalaureate, 72 from the master's.

#### **Course Work**

**Required Courses:** Econ 501, 502, 511, 512, 534, 535, and 592.

Students must also select two areas, each consisting of at least two 500-level economics courses. The required courses and Econ 520, 521, 540, 592, 593, 596, 598, and 599 may not be used to satisfy the area requirement.

**Electives:** One additional graduate-level course in economics and two other graduate-level courses related to the student's area of study in a social science or business discipline outside of economics.

#### **Examinations**

**Departmental Qualifying Examination:** Students must take written qualifying examinations in microeconomics and macroeconomics within two years after admission to the program. Students who receive a failing grade on either exam on two occasions will not be allowed to continue in the PhD program.

**Preliminary Examination:** Written. The exam covers two areas in economics. The oral portion of the exam may be waived on agreement of the examination committee.

#### **Dissertation**

Required.

#### **Interdepartmental Concentration in Gender and Women's Studies**

A student earning a graduate degree in this department may enroll for a graduate concentration in gender and women's studies. The requirements for this concentration are application to the gender and women's studies graduate director; approval by a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor; and a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be in directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor. Students pursuing this concentration must consult the gender and women's studies graduate director.

## **Management Information Systems**

**Mailing Address:** Department of Information and Decision Sciences (MC 075), 601 South Morgan Street, Chicago, Illinois 60607-7122

**Campus Location:** 2331 UH

**Curriculum Code:** 4817 (MS); 4917 (PhD)

**Admission Codes:** 20FS9890MS (MS); 20FS9890PHD (PhD)

**Telephone:** (312) 996-4751

**E-mail:** [agrosi@uic.edu](mailto:agrosi@uic.edu)

**Head of the Department:** Arkalgud Ramaprasad

**Director of Graduate Studies:** Yair Babad

The Department of Information and Decision Sciences offers work leading to the Master of Science in management information systems. This program prepares individuals for information systems-related professional and managerial positions in business, manufacturing, and government. It provides theoretical foundation and technical expertise, business and organization knowledge, and communication skills necessary to manage information system functions in our service and information oriented society.

The Department of Information and Decision Sciences, in participation with the Graduate Business Program, offers the MBA/MS (MIS) joint degree program.

The Department of Information and Decision Sciences also offers work leading to the Doctor of Philosophy in management information systems. This program focuses on an interdisciplinary business understanding of how technology can affect an organization's behavior, structure, and function, and on the effective use, control, and management of information and computer systems.

Both the technical aspects and organizational impact of information management are assessed. A growing faculty on the cutting edge of modern MIS practices ensures dynamic research and teaching possibilities in this field.

## **Admission Requirements**

### **Master of Science**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** While individuals from any baccalaureate field are encouraged to apply, those with non-MIS degrees may be required to complete several background courses. All applicants must complete the following background course work: mathematics through the level of calculus, covering integration and differentiation; statistics through regression analysis; at least two introductory business courses, other than operations management, such as Introduction to Accounting (e.g., Actg 110 and/or 111), Introduction to Finance (e.g., Fin 300), and Introduction to Management and Business Policy (e.g., Mgmt 340 or 495); at least one course in operations management (e.g., IDS 355 or 532); at least one course each in high level programming languages (e.g., IDS 201 or 400), systems analysis and design (e.g., IDS 405 or 505), and database management systems (e.g., IDS 410 or 510); and at least one course in oral and written communications (e.g., BA 200 or Comm 306). Students who have taken these courses more than five years prior to entry to the program may have to retake these courses. Applicants with deficiencies may be allowed into the program on a provisional basis, but must complete the prerequisite deficiencies within their first year of enrollment.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate studies. Applicants with a master's degree must have maintained a GPA of at least 3.00 (A=4.00) in that program.

**Tests Required:** GMAT or GRE taken within five years of entry into the program. Minimum GMAT: 550.

**Minimum TOEFL Score:** 585 (paper-based); 239 (computer-based).

*Letters of Recommendation:* Two required; at least one should be from a former teacher.

*Personal Statement:* Required.

*Other Requirements:* Fall admission is recommended due to course scheduling and prerequisites.

### **Master of Business Administration/Master of Science (MIS)**

Applicants to the joint degree program must apply and be accepted to both the MBA and MS in MIS programs and satisfy the admission requirements independently for both programs. Students already enrolled in the MBA program must apply to the joint degree program before completing more than 32 credit hours of study in the MBA program.

### **Doctor of Philosophy**

Admission is competitive. The Doctoral Studies Programs Office has its own application packets and procedures; all application materials, including transcripts and fees, must be submitted directly to this office. Transcripts for all undergraduate and any graduate work must be submitted in a signed, sealed envelope. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work should include mathematics/statistics, computing/analysis, and business.

*Grade Point Average:* At least 2.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GMAT or GRE. The score must be from a test administered within five years from the requested date of entry. The writing assessment is required.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the intellectual skills, perseverance, and integrity of the applicant. At least one recommendation should be from an academic familiar with the applicant's work.

*Personal Statement:* Required. 500 words. The statement should address the applicant's interests and qualifications, including research interests and the impact this work is expected to have on the applicant's career.

*Other Requirements:* Interviews with the faculty in the area of interest are advised. Students are admitted only in the fall semester.

### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Business Administration's Doctoral Studies Programs Office for information on current deadlines.

### **Degree Requirements**

#### **Master of Science**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 32.

#### **Course Work**

*Required Courses:* IDS 401, 507, and 520.

*Electives:* Five courses with the approval of an advisor. By choosing suggested electives, a student may choose to concentrate in 1) programming and design, 2) e-business Systems, 3) data management, or 4) systems management. Courses used to satisfy admission requirements (e.g., IDS 405 or 510) cannot be counted toward degree requirements.

The following are suggested concentrations, but students may take any of the courses listed below:

Programming and Design: IDS 420, 521, 526.

E-Business Systems: IDS 504, 508, 518 (Mktg 518), 521.

Data Management: IDS 472, 511 (CS 580), 516, 521.

Systems Management: IDS 454, 495, 514, 523.

General Electives: CS 470, 480, 581, 582; IDS 522.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

### **Master of Business Administration/Master of Science (MIS)**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 70.

#### **Course Work**

All requirements of the MBA degree must be satisfied, and all requirements of the MS in MIS must be satisfied. At most, four courses may be counted toward the requirements of both degrees. Prerequisite database courses and other prerequisite courses may not be used to satisfy any part of the eight-course requirement for the MS in MIS part of the joint program.

*Required Courses:* Actg 500; Econ 520; Fin 500; IDS 401, 507, 520, 532; Mgmt 541; and Mktg 500.

*Electives:* 20 semester hours (5 courses) chosen in consultation with the director of the MS in MIS program to fulfill the MS portion of the joint degree; and a minimum of 16 semester hours (4 courses) chosen from 500-level courses in at least three departments within the College of Business Administration. No more than two 400-level courses can be counted toward the MS portion of the degree.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

### **Doctor of Philosophy**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 96 from the baccalaureate, 64 from the MBA.

#### **Course Work**

The first year of study will include a two-course requirement in mathematics, statistics, or computing; a four-course breadth requirement (four MBA core courses, no two of which are from the same functional area and none of which are from the area of inquiry); and a six-course depth requirement (advanced courses, at least two of which are sufficiently rigorous to provide the basis for the qualifying exam). Following the qualifying exam, additional course requirements are determined by the student's advisor.

*Required Courses:* Any two from among Econ 504; IDS 527; Mgmt 581, 582; Mktg 571; Phil 517, 521; PolS 500; or PPA 500; plus at least 8 hours of research methodology in the student's degree area. Additional required courses vary by degree area; contact the Doctoral Studies Program Office for information on the specific requirements of each area.

#### **Examinations**

*Qualifying Examination:* A written exam, based upon courses used for the student's depth requirement, is required and will be administered by faculty in the student's area of inquiry.

*Preliminary Examination:* A written and/or oral exam, addressing advanced material in the area of inquiry and/or the student's plans for dissertation research, is required.

#### **Dissertation**

A dissertation demonstrating the ability to conduct original, scholarly research is required. No more than 32 hours of doctoral thesis research can be applied to the degree.

#### **Other Requirements**

Students must serve as a teaching assistant or research assistant. This requirement may be waived for students with appropriate teaching or research experience.

# College of Dentistry

## Oral Sciences

*Mailing Address: College of Dentistry (MC 621), 801 South Paulina Street, Chicago, Illinois 60612-7211*

*Campus Location: 102 Dent*

*Curriculum Code: 5019*

*Admission Code: 20FS1525MS*

*Telephone: (312) 996-0213*

*E-mail: zfmuhl@uic.edu*

*Director of Graduate Studies: Zane F. Muhl*

The College of Dentistry offers a program of study and research leading to the Master of Science degree in oral sciences. The graduate program provides education in areas including, but not limited to, molecular biology, biochemistry, cell biology, histology, pathology, biomaterials, immunology, behavioral sciences, clinical sciences, and functional morphology with an emphasis on the oral structures in health and disease. The program provides graduate training to increase understanding of oral disease along with a strong research experience. Students have a variety of opportunities for specialization within the program according to their interests and their chosen careers in dentistry. Research is conducted in one of the following units: endodontics, oral biology, orthodontics, oral and maxillofacial surgery, oral pathology, pediatric dentistry, periodontics, restorative dentistry, and the Center for Molecular Biology of Oral Diseases.

## Admission Requirements

An applicant must first obtain an endorsement from one of the academic units in the College of Dentistry *before* filing an application. Endorsement is obtained by forwarding a personal statement and resumé to the department head in the dental discipline where approval is sought. Applicants are considered on an individual basis. Contact the graduate program in the College of Dentistry for a list of department heads.

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* BS, BA, or equivalent degree. Prior academic course work should include biology, general chemistry, histology, and other related sciences.

*Grade Point Average:* At least 2.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate or previous postgraduate study.

*Tests Required:* The GRE general is required of all applicants except those who are either currently enrolled in or are graduates of a DDS, MD, DVM, or equivalent program.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from individuals acquainted with the applicant's recent academic work. These are sent directly to the head of the department where an endorsement has been received.

*Personal Statement:* Required. The statement should include a brief summary describing the applicant's area of interest, purpose, and desired discipline of study. This statement along with a current resumé is sent directly to the department in which an endorsement is being sought.

*Other Requirements:* None.

## Nondegree Applicants

Nondegree applicants must obtain approval from the director of graduate studies in the College of Dentistry for admission to the program.

## Degree Requirements

**Minimum Semester Hours Required:** 32 credit hours as specified below.

### Course Work

*Required Courses:* Bstt 400 or equivalent; OSci 451, 452, 580, 581; at least 6 credit hours of OSci 598; and 9 credit hours of 500-level graduate courses.

*Selectives:* At least 6 credit hours; one course must be in the student's area of research.

*Electives:* Additional courses needed to satisfy the remaining credit hours may be chosen from the offerings listed in the *Graduate College Catalog*.

### Comprehensive Examination

None.

### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

*Thesis:* Students must earn at least 6 hours in OSci 598. No more than 20 hours of OSci 598 can be applied to the degree.

## College of Education

The College of Education offers work leading to the Doctor of Philosophy in education: (curriculum and instruction), with specializations in (1) curriculum design; (2) reading, writing, and literacy; and (3) educational psychology (an interdepartmental specialization); the Doctor of Philosophy in education: special education; and the Doctor of Philosophy in policy studies in urban education, with specializations in (1) educational organization and leadership and (2) social foundations of education. The Master of Education degree is offered in educational leadership and administration; special education; and instructional leadership, with specializations in (1) early childhood education; (2) curriculum and instruction; (3) reading, writing, and literacy; and (4) educational studies (which allows students to develop a self-designed program or to pursue State of Illinois certification in either elementary or secondary education, and/ or to acquire a bilingual/ESL approval). Consult the appropriate sections in this catalog or the College of Education Web site (<http://www.uic.edu/educ/index.html/>) for more information. Requirements are subject to change; contact the College of Education to determine the requirements currently in effect.

### Curriculum and Instruction

*Mailing Address: College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133*

*Campus Location: 3145 EPASW*

*Telephone: (312) 996-4532*

*Curriculum Code: 5120*

*Admission Code: 20FS1182PHD*

*E-mail: [mgiova1@uic.edu](mailto:mgiova1@uic.edu)*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Ruth Pearl*

The College of Education offers work leading to the Doctor of Philosophy in education: curriculum and instruction, with specializations in curriculum design and in reading, writing, and literacy, and an interdepartmental specialization in educational psychology.

### Admission Requirements

Applicants are considered on an individual basis. Transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of study and for all postbaccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from faculty members or others familiar with the applicant's previous academic training, academic and research ability, and experience.

*Personal Statement:* Required. The statement must address the applicant's professional goals.

*Other Requirements:* Admission is restricted to the summer and fall terms.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Education for information on current deadlines.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 96 from the baccalaureate.

### Course Work

*Required Courses:* Ed 500, 501, and 502; EPsy/Ed 503. Students specializing in curriculum design must also take four hours of CIE 574 and at least one hour of CIE 500. Students specializing in reading, writing, and literacy must also take CIE 563. Additional required courses vary by specialization; contact the College of Education for each specialization's specific requirements.

Courses in the area of concentration will constitute one-quarter to one-third of the 64 hours beyond the master's degree. Students are encouraged to take courses in other disciplines such as anthropology, psychology, gender and women's studies, and sociology, provided that College of Education courses constitute at least two-thirds of the required hours.

### Examinations

*Preliminary Examination:* Required; written and oral. The written examination is based on the student's course work. The oral portion of the examination is based on both the written examination and the student's dissertation prospectus.

### Dissertation

Required. Students must register for doctoral thesis research for at least 16 semester hours. The research must be theoretical in nature and use methods of inquiry appropriate to the problem being investigated.

### Other Requirements

All students must participate in a research project in collaboration with a faculty member or a team of faculty members and students. Projects will focus on research problems in the student's area. The student will make a formal presentation, oral or written, of the project findings. Eight semester hours of credit are awarded for the project, requiring at least two semesters to complete.

### Interdepartmental Specialization in Educational Psychology

In addition to meeting the above requirements for the PhD in education, students pursuing a specialization in educational psychology must take Psch 517, 550, and 551, and an additional 8 hours of approved electives. At least 3 hours must be in courses outside of education, and at least 3 hours must be taken in educational measurement.

### Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies (more information is at the end of the College of Education section).

### Educational Policy and Administration

*Mailing Address: College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133*

*Campus Location: 3145 EPASW*

*Telephone: (312) 996-4532*

*Curriculum Code: 0520*

*E-mail: [mgiova1@uic.edu](mailto:mgiova1@uic.edu)*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Ruth Pearl*

The College of Education offers work leading to the Doctor of Philosophy in educational policy and administration, with specializations in elementary and secondary education, higher education, or evaluation research and design.



## Admission Requirements

This program is no longer admitting new students. Individuals who are interested in the study of educational policy and administration are encouraged to apply to the PhD program in policy studies in urban education.

## Instructional Leadership

*Mailing Address: College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133*

*Campus Location: 3145 EPASW*

*Telephone: (312) 996-4532*

*Curriculum Code: 5020*

*Admission Code: 20FS1355MED*

*E-mail: mherkes@uic.edu*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Ruth Pearl*

The College of Education offers work leading to the Master of Education in instructional leadership, with specializations in early childhood education (Type 04 certificate); curriculum and instruction; reading, writing, and literacy (Type 10); or educational studies. The latter specialization allows students to develop a self-designed program or to pursue State of Illinois certification in either elementary (Type 03) or secondary (Type 09) education, and/or to acquire a bilingual/ESL approval.

## Admission Requirements

Applicants are considered on an individual basis. The following requirements for admissions represent recommended minimum levels of performance. Decisions will be made on the strength of the overall evidence of academic and professional capacities and on available enrollment space. Transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* Recommended minimum of 2.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study and at least 3.00 for all postbaccalaureate course work or graduate course work. The program requires submission of all transcripts regardless of the age of course or degree work.

*Tests Required:* None.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:*

Curriculum and Instruction and Early Childhood Education—none.

Educational Studies—three required addressing the applicant's academic qualifications, research ability/experience, and ability to carry on advanced degree studies. Letters may be from current or former professors or supervisors.

Reading, Writing, and Literacy—three required addressing the applicant's academic qualifications, teaching experience, research ability, and ability to carry on advanced degree studies. Letters may be from current or former professors or supervisors. Please do not have letters submitted from relatives or friends.

*Other Requirements:*

Curriculum and Instruction—applicants must present previous course work in education policy studies or the learning process, in curriculum and instruction or evaluation, and in reading. At least one year of full-time teaching experience or comparable work in such fields as recreation or program development is also required.

Early Childhood Education—applicants must submit a completed questionnaire regarding interest and experience with young children. Please note that the questionnaire requires two essays to be written. Make sure you submit the

entire packet at one time to the Office of Student Services.

Educational Studies—a typed, 3–4 page double-spaced statement that describes the applicant's interest in education and goals for the MED program.

Reading, Writing, and Literacy—none.

## Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Education for information on current deadlines.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** Varies by specialization. Early Childhood Education and Educational Studies—32 hours; Curriculum and Instruction—35 hours; Reading, Writing, and Literacy—38 hours.

## Course Work

*Required Courses:* Curriculum and Instruction—Ed 402 or 403; Ed 421, 422, or 445; Ed 430, 431, and 490; and CIE 532 and 539.

Early Childhood Education—Ed 402 or 403; Ed 422; Ed 430 or 431; and EPsy 429, 520, 521, and 524.

Educational Studies—Ed 402 or 403; Ed 421, 422, or 445; Ed 430 or 431; and fourteen semester hours of graduate work offered by the College of Education and selected with the consent of the faculty advisor.

Reading, Writing, and Literacy—Ed 402 or 403; Ed 421, 422, or 445; Ed 430 or 431; and CIE 459, 460, 560, 565, 566, and 580. Students must also take eight semester hours of graduate course work in one of the following areas: reading research; reading and writing; language and reading; technology and reading; bilingualism and literacy; text, literature, and instructional materials; learning disabilities and reading; reading comprehension; or cognition, instruction, and literacy. These courses are selected with the consent of the faculty.

## Comprehensive Examination

Required only for students in the Reading, Writing, and Literacy specialization; written.

## Thesis, Project, or Course-work-only Options

Course work only. No other options available.

## Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies (more information is at the end of the College of Education section).

## Leadership and Administration

*Mailing Address: College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133*

*Campus Location: 3145 EPASW*

*Telephone: (312) 996-4532*

*Curriculum Code: 0420*

*Admission Code: 20FS1409MED*

*E-mail: mherkes@uic.edu*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Ruth Pearl*

The College of Education offers work leading to the Master of Education in leadership and administration (option for type 75 administrative certificate).

## Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study and

at least 3.00 for all postbaccalaureate work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement must address the applicant's academic and professional goals and describe relevant prior experiences.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline. Contact the College of Education for information on current deadlines.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 33.

#### **Course Work**

*Required Courses:* Ed 402 or 403; Ed 421, 422, or 445; Ed 430; and PS 550, 552, 556, 559, 568, and 573.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies (more information is at the end of the College of Education section).

### **Policy Studies in Urban Education**

*Mailing Address:* College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133

*Campus Location:* 3145 EPASW

*Telephone:* (312) 996-4532

*Curriculum Code:* 0420

*Admission Code:* 20FS1592PHD

*E-mail:* mgiova1@uic.edu

*Dean of the College of Education:* Victoria Chou

*Director of Graduate Studies:* Ruth Pearl

The College of Education offers work leading to the Doctor of Philosophy in policy studies in urban education with specializations in educational organization and leadership and social foundations of education.

### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of study and for all postbaccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement must address the applicant's goals for graduate study and career development.

*Other Requirements:* Admission is restricted to the summer and fall terms.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Education for information on current deadlines.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 111–116 from the baccalaureate, 79–84 from the master's.

#### **Course Work**

*Required Courses:* Minimum beyond the master's—20 hours in concentration-specific courses including proseminar PS 510; 20 hours in research methods; 25–28 hours in electives, including three field-related courses outside the College of Education.

*Required Concentration-specific Courses for Educational Organization and Leadership:* PS 510, 571, 579, 587 (one topic), and 589.

*Required Concentration-specific Courses for Social Foundations of Education:* PS 510 and four required courses taken from the following: PS 566, 567, 570, 571, 572, 582, 583, or 588.

*Required Research Methods Courses:* Ed 500 and 544; PS 512; and two more, depending on concentration. These are, for education organization and leadership, Ed 503 and one upper-level course chosen in consultation with advisor; and for Social Foundations, two research methods courses chosen with advisor.

#### **Electives**

Each student will support the concentration with 23–28 elective hours related to research methods, policy, administration, leadership, organizations, or such social foundations course work as history, philosophy, sociology, anthropology, and political science; or from a related field of study such as gender studies, African-American studies, disability studies, or Latino studies, to be chosen in consultation and with the consent of a faculty advisor. Three of these courses must be taken in a field or discipline outside the College of Education.

#### **Examinations**

*Comprehensive Written Qualifying Examination:* Required. Successful completion of the comprehensive exam qualifies students to enter the dissertation proposal stage of the program. Administered twice annually, to examine student on program curriculum, student area of specialization, and research methods prior to admission to dissertation proposal stage. No student with a cumulative GPA below 3.00 (A=4.00) will be permitted to take the qualifying examination. Students who fail to pass all components after the second attempt will be recommended by the program faculty to the Graduate College for dismissal from the program.

Students will be required to submit an annual review, in compliance with college policy on doctoral programs, to show evidence of academic and professional progress.

*Preliminary Examination:* Required. The preliminary examination is taken at the completion of all course work. The examination is primarily oral but may contain a written component. The primary purpose of the preliminary examination is review and approval of the dissertation proposal and admission of the student to degree candidacy.

#### **Dissertation**

Required. Students must earn at least 16 semester hours in PS 599. The completed dissertation must be defended orally and publicly before the dissertation committee.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies (more information is at the end of the College of Education section).

## Special Education

*Mailing Address:* College of Education (MC 147), 1040 West Harrison Street, Chicago, Illinois 60607-7133

*Campus Location:* 3145 EPASW

*Telephone:* (312) 996-4532

*Curriculum Codes:* 3520 (MEd), 4120 (PhD)

*Admission Codes:* 20FS0093MED (MEd); 20FS1183PHD (PhD)

*E-mail:* mherkes@uic.edu (MEd); mgiova1@uic.edu (PhD)

*Dean of the College of Education:* Victoria Chou

*Director of Graduate Studies:* Ruth Pearl

The College of Education offers work leading to the Master of Education in special education and the Doctor of Philosophy in education: special education. With additional course work and field experiences, students can obtain the State of Illinois Learning Behavior Specialist I teaching certificate. The emphasis is on preparing individuals to become special educators in urban settings.

## Admission Requirements

Applicants are considered on an individual basis. Transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

### Master of Education

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 2.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of study, and at least 3.00 (A=4.00) for all postbaccalaureate course work.

*Tests Required:* None.

*Minimum TOEFL Score:* 550 (paper-based); 213

(computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required; 300 words.

*Impromptu Writing:* The applicant will be required to write an essay in response to a case study provided by program faculty.

*Interview:* Two faculty members will interview each applicant.

For information about the statement of intent, impromptu writing requirement, and interview, contact the Office of Student Services in the College of Education at (312) 996-4532.

*Other Requirements:* Admission is restricted to fall and spring terms.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Education for information on current deadlines.

### Doctor of Philosophy

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of study and for all postbaccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from faculty members or others familiar with the applicant's previous academic training, academic and research ability, and experience.

*Personal Statement:* Required. The statement must address the applicant's professional goals.

*Other Requirements:* Admission is restricted to the summer and fall terms.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the College of Education for information on current deadlines.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

### Master of Education

**Minimum Semester Hours Required:** 35 for the MEd (at least 21 hours in special education—9 hours required at the 500 level); additional hours are required for the Learning Behavior Specialist I certificate.

#### Course Work

*Required Courses:* SpEd 482/EPsy 482; SpEd 573.

*Select One (political and social context):* DHD 401, 430, 514, 570; Dis 535, Ed 402, 403; EPsy 449; PS 406, 570, 571, 582; SpEd 461/Ed 461.

*Select One (characteristics of learners):* Ed 421, 422, EPsy 420, 429, 446, 502; SpEd 465/EPsy 465, 466, 467.

*Select One (promoting academic learning):* CIE 480, 482; Ed 473/SpEd 473; SpEd 463, 471, 583.

*Select One (promoting social and emotional learning):* Ed 472/SpEd 472, SpEd 572.

*Select One (assessing students' needs):* SpEd 462, 576.

*Select One (internship):* SpEd 577, 578, 579.

*Select One Concentration:*

**Concentration I** (for students seeking the MEd degree only).

*Required Course:* Ed 445.

*Electives:* 9 semester hours.

**Concentration II** (for students seeking the MEd degree and the LBS II certificate).

*Required Course:* Ed 445.

*Electives:* 9 semester hours of coursework that align with Illinois State Board of Education standards for the LBS II certificate.

**Concentration III** (for students seeking the MEd and the LBS I certificate).

*Required Courses:* 8 additional courses [including student teaching (SpEd 580) for those individuals who have not successfully completed a student teaching experience]. Students seeking the master's degree and either the LBS I or LBS II certificate must work closely with a faculty advisor to plan a course of study that will lead to both the degree and the certificate.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Course work only. No other options available.

### Doctor of Philosophy

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### Course Work

*Required Courses:* Ed 500, 501, and 502; EPsy/Ed 503; SpEd 564; and three special education seminars (12 hours).

Courses in the area of concentration will constitute one-quarter to one-third of the 64 hours beyond the master's degree. Students are encouraged to take courses in other disciplines such as anthropology, psychology, women's studies, and sociology, provided that College of Education courses constitute at least two-thirds of the required hours.

#### Examinations

*Preliminary Examination:* Required; written and oral. The written examination is based on the student's course work. The oral portion of the examination is based on both the written examination and the student's dissertation prospectus.

***Dissertation***

Required. Students must register for doctoral thesis research for at least 16 semester hours. The research must be theoretical in nature and use the methods of inquiry appropriate to the problem being investigated.

***Other Requirements***

All students must participate in a research project in collaboration with a faculty member or a team of faculty members and students. Projects will focus on research problems in the student's area. The student will make a formal presentation, oral or written, of the project findings. Eight semester hours of credit are awarded for the project, requiring at least two semesters to complete.

***Interdepartmental Concentration in Gender and Women's Studies***

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.



## College of Engineering

The UIC College of Engineering also offers a program leading to a Master of Engineering (MEngr) degree. This professional program is not part of the Graduate College. Contact the College of Engineering for more information at (312) 996-9806.

### Bioengineering

*Mailing Address:* Department of Bioengineering (MC 063), 851 South Morgan Street, Chicago, Illinois 60607-7052

*Campus Location:* 218 SEO

*Curriculum Code:* 6522

*Admission Codes:* 20FS0408MS (MS); 20FS0408PHD (PhD)

*Telephone:* (312) 996-2331

*E-mail:* bioe@uic.edu

*Homepage:* www.uic.edu/depts/bioe

*Head of the Department:* Richard L. Magin

*Director of Graduate Studies:* Michael Strosio

The Department of Bioengineering offers graduate programs leading to Master of Science and Doctor of Philosophy degrees in bioengineering. The departmental focus is molecular engineering at natural and synthetic interfaces. The concentration areas are in cell and tissue engineering, neural engineering, and bioinformatics and genomics. Biocompatibility, immunotolerance, drug discovery and delivery, molecular targeting and transport, biotransduction, imaging and inducible bioactivity, computational genomics, structural bioinformatics, and cheminformatics are collaborative disciplines found in the concentration areas. The Laboratory for Biomedical Engineering (LBE), established by the university within its medical center, coordinates and implements clinically based bioengineering activities. The departmental programs are directed toward applying advanced methods of interfacial molecular bioengineering to clinical problems of diagnosis and treatment. The curriculum provides students with an introduction to molecular modeling, targeting, transport, detection, and nanofabrication complemented by collaborative molecular bioengineering research with biologists, chemists, and clinicians. In addition, curricula in the traditional bioengineering areas of signal and image processing, biocontrol, biomaterials, medical visualization, biomechanics, pattern recognition and rehabilitation engineering are available.

### Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### Master of Science

*Baccalaureate Field:* Physical sciences, engineering, computer science, mathematics, biology, or medicine. Students from other areas are also encouraged to apply if their backgrounds indicate a reasonable chance of success in the program.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general, minimum 1800 total.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

#### Doctor of Philosophy

*Baccalaureate Field:* Physical sciences, engineering, computer science, mathematics, biology, or medicine. Students from other areas are also encouraged to apply if

their backgrounds indicate a reasonable chance of success in the program.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general, minimum 1800 total.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 36.

##### Course Work

At least twelve hours must be at the 500 level, excluding Bioe 595, 596, or 598.

*Required Courses:* 1 hour of Bioe 595. Additional required courses vary by area; contact the department for the specific requirements of each area.

##### Comprehensive Examination

None

##### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

*Thesis:* Students must earn at least 8 hours in Bioe 598.

##### Other Requirements

Each student must present at least one seminar prior to graduation.

#### Doctor of Philosophy

*Minimum Semester Hours Required:* 108 from the baccalaureate.

##### Course Work

At least 32 hours must be at the 500 level, excluding Bioe 599.

*Required Courses:* PhyB 401 and 402; and 1 hour of Bioe 595. Additional required courses vary by area; contact the department for the specific requirements of each area.

##### Examinations

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required.

##### Dissertation

Required. Students must earn at least 44 semester hours in Bioe 599.

##### Other Requirements

Each student is required to present at least two seminars prior to graduation.

Students must be registered during the semester of intended graduation.

### Chemical Engineering

*Mailing Address:* Department of Chemical Engineering (MC 110), 810 South Clinton Street, Chicago, Illinois 60607-7000

*Campus Location:* 204 CEB

*Curriculum Code:* 0622

*Admission Codes:* 20FS0300MS (MS); 20FS0300PHD (PhD)

*Telephone:* (312) 996-3425

*E-mail:* kmilla@uic.edu

*Head of the Department:* Kenneth Brezinsky

*Codirectors of Graduate Studies:* Andreas Linninger and Christos Takoudis

The Department of Chemical Engineering offers a program leading to degrees in chemical engineering at both

the master's and doctoral levels. The primary areas on which this program is based are continuum and molecular fluid mechanics, heat and mass transfer, macroscopic and microscopic thermodynamics, chemical kinetics, process analysis, microelectronic materials and processing, heterogeneous catalysis, process design, and pollution prevention.

### **Admission Requirements**

The department reviews each applicant on an individual basis. Complete transcripts of all undergraduate and any graduate work must be submitted. In addition to meeting the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Engineering.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study for the master's program, and at least 3.50 for the doctoral program. In exceptional cases, applicants with averages below 3.00 but above 2.75 may be admitted on limited standing if they show evidence of substantial ability to complete the program successfully.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Not required.

### **Degree Requirements**

In addition to meeting the minimum requirements of the Graduate College, students must also meet the following program requirements:

#### **Master of Science**

*Minimum Semester Hours Required:* 36.

##### **Course Work**

At least 12 semester hours must be at the 500 level.

*Required Courses:* ChE 410; either 431 or 445; either 501 or 502; either 510 or 511 or 512; 527; and either 592 or 598.

##### **Comprehensive Examination**

Required only for students who do not write a thesis.

##### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

#### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 108 from the baccalaureate.

##### **Course Work**

At least 24 semester hours must be at the 500 level.

*Required Courses:* ChE 410; either 431 or 445; either 501 or 502; either 510, 511, or 512; and 527. Students must register in ChE 595 for one semester hour each term. Additional required courses vary by area; contact the program for information on the specific requirements of each area.

*Electives:* At least 8 semester hours, including at least one 500-level course, must be taken in the Department of Mathematics, Statistics, and Computer Science.

##### **Examinations**

*Preliminary Examination:* Required; written.

##### **Dissertation**

Required. Students must earn at least 44 hours in ChE 599.

##### **Other Requirements**

Each student must present a seminar based on his or her research in ChE 595 at least once.

## **Civil Engineering**

*Mailing Address:* Department of Civil and Materials Engineering (MC 246), 842 West Taylor Street, Chicago, Illinois 60607-7023

*Campus Location:* 2067 ERF

*Curriculum Code:* 1322

*Admission Codes:* 20FS0106MS (MS); 20FS0106PHD (PhD)

*Telephone:* (312) 996-3411

*E-mail:* rlmorrow@uic.edu

*Head of the Department:* Farhad Ansari

*Director of Graduate Studies:* Michael McNallan

The Department of Civil and Materials Engineering (CME) offers programs leading to the Master of Science and Doctor of Philosophy degrees in civil engineering. Study and research leading to a degree in civil engineering is available in the areas of soil mechanics and foundations, environmental engineering, structural engineering, earthquake engineering, reinforced and prestressed concrete, steel structures, and transportation engineering.

The department also offers programs leading to degrees in materials engineering at both the master's and doctoral levels, and participates with the Department of Geological Sciences in offering a coordinated program leading to the Doctor of Philosophy in geotechnical engineering and geosciences. Consult the appropriate chapters in this catalog for more information on these other programs.

Updated information about the faculty, staff, curriculum and courses is found on the CME home page at the following address: <http://www.uic.edu/depts/cme/cme.html>.

### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Civil engineering or a related field.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE General.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Required for PhD applicants.

*Personal Statement:* Not required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

*Minimum Semester Hours Required:* 36.

##### **Course Work**

At least 24 semester hours must be in courses chosen from a list of major courses which is available from the director of graduate studies. At least 12 hours must be at the 500 level, and at least 8 hours must be in 500-level courses in the department, excluding CEMM 598.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

#### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 112 from the baccalaureate.

##### **Course Work**

Students must take at least four 500-level courses in the department, excluding CEMM 599.

## Examinations

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required.

## Dissertation

Required. Students must earn at least 44 hours in CEMM 599.

## Computer Science

*Mailing Address:* Department of Computer Science (MC 152), 851 South Morgan Street, Chicago, Illinois 60607-7053

*Campus Location:* Department Office 1120 SEO; Student Affairs Office 905 SEO

*Curriculum Code:* 1422 (MS); 1822 (PhD)

*Admission Codes:* 20FS0112MS (MS); 20FS0112PHD (PhD)

*Telephone:* (312) 413-2290

*E-mail:* grad@cs.uic.edu

*Head of the Department:* Peter Nelson

*Director of Graduate Studies:* Sol Shatz

The Department of Computer Science offers graduate programs leading to computer science degrees at the master's and doctoral levels. Consult the *CS Graduate Student Manual* for current requirements, policies, and regulations. Updated information about the faculty, staff, curriculum and courses is found on the CS home page at the following address: <http://www.cs.uic.edu>.

The department offers a comprehensive range of courses in the field of computer science. Special emphases lie in the areas of compilers and programming languages, software engineering, database systems, graphics and human-computer interaction, computer vision, artificial intelligence, theoretical computer science, computer architecture, computer networks, and operating systems.

The department maintains and provides full-time technical staff for several specialized research laboratories, primarily housed in the instructional computing laboratories in the Engineering Research Facility. The laboratories contain over 300 workstations and servers and an extensive array of computer-based multimedia equipment.

All departmental computing facilities are networked to general university computing resources and national networks, which permits high-speed access to specialized computing facilities.

## Admission Requirements

Applications are considered on an individual basis by the Graduate Admissions Committee. A complete set of transcripts of all undergraduate and graduate work is required before an applicant is considered. In addition to the application requirements of the Office of Admissions and Records and the policies set by the Graduate College, applicants must meet the following program requirements:

### Master of Science

*Baccalaureate Field:* Computer Science or Computer Engineering. Outstanding candidates from other related fields will also be considered.

*Grade Point Average:* At least 3.25 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE scores are not required for admission consideration, but are strongly recommended. Applicants planning to seek a university fellowship or other financial support (department fellowship/TA/RA/TFW) must submit general GRE scores; the CS subject area GRE is also recommended. Graduates of non-English-speaking countries who are requesting TA consideration are recommended to submit a TSE score (minimum acceptable score is 50).

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).

*Letters of Recommendation:* Not required for admission unless specifically requested by the Graduate Admissions Committee after reviewing academic and other credentials. Applicants for financial assistance must provide three letters of recommendation.

*Personal Statement:* Not required.

### Deadlines

The application deadline is the same as the Graduate College deadline. University fellowship nominations are due in the first week of February, and department financial aid decisions (TA/TFW) are made about the middle of March.

### Doctor of Philosophy

*Prior Degrees:* Computer Science or Computer Engineering. Outstanding candidates from other related fields will also be considered. Outstanding candidates holding a bachelor's degree in computer science can be considered for admission.

*Grade Point Average:* At least 3.25 (A=4.00).

*Tests Required:* GRE general scores are not required for admission consideration, but are strongly recommended. Applicants planning to seek a university fellowship or other financial support (department fellowship/TA/RA/TFW) must provide GRE general. Graduates of non-English-speaking countries who are requesting TA consideration must submit a TSE score (minimum acceptable score is 50).

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Not required.

*Other Requirements:* No limited-status admissions.

### Deadlines

The application deadline is the same as the Graduate College deadline. University fellowship nominations are due in the first week of February, and department financial aid decisions (TA/TFW) are made about the middle of March.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

### Master of Science

*Minimum Semester Hours Required:* 36.

#### Course Work

At least 24 hours must be in courses offered by the Department of Computer Science, 12 of which must be CS course offerings at the 500 level (excluding CS 595–599). No more than one special topics course (CS 594) may be counted toward the 500-level requirement. No credit earned in CS 596 (Individual Study) may be applied towards the MS degree.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Thesis or project required. No other options available.

*Thesis:* Thesis students must earn 8 hours in CS 598; no more than 8 hours of CS 598 may be applied toward the degree.

*Project:* Project students must earn 4 hours in CS 597; no more than 4 hours of CS 597 may be applied toward the degree.

### Doctor of Philosophy

*Minimum Semester Hours Required:* 108 from the baccalaureate.

#### Course Work

*Student admitted with prior master's degree in CS or a related field:* Must complete a minimum of 28 hours of credit in CS or non-CS graduate course work. Credit for

non-CS course work must have prior department approval. Of the 28 hours, at least 16 hours must be CS course work at the 500 level, excluding CS 595, 596, 597, 598, and 599. Any course that is nearly equivalent to one taken in the bachelor's or master's program earlier will not earn PhD credit. Credit earned in CS 596 may not be applied toward the PhD degree.

*Student admitted directly after bachelor's degree in CS or a related field:* Must complete a minimum of 48 hours of credit in CS or non-CS graduate course work. Credit for non-CS course work must have prior department approval. Of the 48 hours, at least 28 hours must be CS course work at the 500 level, excluding CS 595, 596, 597, 598, and 599. Credit earned in CS 596 may not be applied toward the PhD degree.

#### **Examinations**

*Departmental Qualifying Examination:* Required; written.

*Preliminary Examination:* Required; oral.

#### **Dissertation**

Required. Candidates must earn CS 599 credit of at least 48 hours credit beyond a master's degree and at least 60 hours beyond a bachelor's degree.

#### **Fellowships**

The department offers doctoral fellowships each year to highly qualified new PhD students. The applicants must be U.S. citizens or permanent residents. These fellowships will be for three-year duration and will provide a stipend of \$15,000 per calendar year, plus tuition and fee waivers. Exceptionally qualified MS students planning to continue for the PhD will also be considered.

### **Electrical and Computer Engineering**

*Mailing Address:* Department of Electrical and Computer Engineering (MC 154), 851 South Morgan Street, Chicago, Illinois 60607-7053

*Campus Location:* Department Office 1020 SEO; Student Affairs Office 900 SEO

*Curriculum Code:* 2022 (MS); 2222 (PhD)

*Admission Codes:* 20FS1200MS(MS); 20FS1200PHD (PhD)

*Telephone:* (312) 413-2291 or (312) 996-4325

*E-mail:* grad-info@ece.uic.edu

*Head of the Department:* Mitra Dutta

*Director of Graduate Studies:* Rashid Ansari

The Department of Electrical and Computer Engineering offers graduate programs leading to electrical and computer engineering degrees at the master's and doctoral levels. Consult the *ECE Graduate Student Manual* for current requirements, policies, and regulations. Updated information about the faculty, staff, curriculum, and courses is found on the ECE home page at the following address: <http://www.ece.uic.edu>.

The department offers a comprehensive range of courses in the field of electrical engineering and computer engineering. Special emphases lie in the areas of signal and image processing, solid state and microfabrication, electromagnetics and optics, power electronics, communications, systems and controls, circuits and networks, computer/machine vision, computer architecture, VLSI design, and computer networks.

The department maintains and provides full-time technical staff for several specialized research laboratories, primarily housed in the recently constructed Engineering Research Facility. The labs are used for both instruction and graduate student research. The laboratories contain over 100 workstations and servers and an extensive array of computer-based multimedia equipment.

The department maintains two large, modern instructional computing facilities, including ten UNIX file servers managing a total of more than ninety-five gigabytes of disk space, four UltraSPARC computer servers, and 130 student-accessible Sun Workstations for software development, database programming, VLSI design, HTML development, and numerical computing. There are also four Silicon Graphics workstations equipped with 24-bit graphics, and thirty-four Macintosh computers used for assembly language programming and HTML development. All computers are networked via ten-megabit switched Ethernet.

All departmental computing facilities are networked to general university computing resources and national networks, which permits high-speed access to specialized computing facilities such as Connection Machine, Power Challenge Array, the IBM-SP-2 at Argonne National Laboratory, and the Convex supercomputers at the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign.

#### **Admission Requirements**

Applications are considered on an individual basis by the Graduate Admissions Committee. A complete set of transcripts of all undergraduate and graduate work is required before an applicant is considered. In addition to the application requirements of the Office of Admissions and Records and the policies set by the Graduate College, applicants must meet the following program requirements:

##### **Master of Science**

*Baccalaureate Field:* Electrical or computer engineering, or other closely related curriculum.

*Grade Point Average:* At least 3.25 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE scores are not required for admission consideration, but are strongly recommended. Applicants planning to seek a university fellowship or other financial support (department fellowship/TA/RA/TFW) must submit general GRE scores. Graduates of non-English-speaking countries who are requesting TA consideration must submit a TSE score (minimum acceptable score is 50).

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).

*Letters of Recommendation:* Not required for admission unless specifically requested by the Graduate Admissions Committee after reviewing academic and other credentials. Applicants for financial assistance must provide three letters of recommendation.

*Personal Statement:* Not required.

##### **Deadlines**

The application deadline is the same as the Graduate College deadline. University fellowship nominations are due in the first week of February, and department financial aid decisions (TA/TFW) are made about the middle of March.

##### **Doctor of Philosophy**

*Prior Degrees:* Applicants must have a Master of Science degree in electrical engineering or computer engineering.

*Grade Point Average:* At least 3.50 (A=4.00).

*Tests Required:* GRE scores are not required for admission consideration, but are strongly recommended. Applicants planning to seek a university fellowship or other financial support (department fellowship/TA/RA/TFW) must submit general GRE scores. Graduates of non-English-speaking countries who are requesting TA consideration must submit a TSE score (minimum acceptable score is 50).

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).



*Letters of Recommendation:* Three required.  
*Personal Statement:* Not required.  
*Other Requirements:* No limited-status admissions.

#### **Deadlines**

The application deadline is the same as the Graduate College deadline. University fellowship nominations are due in the first week of February, and department financial aid decisions (TA/TFW) are made about the middle of March.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

##### **Master of Science**

**Minimum Semester Hours Required:** 36 for thesis option. 40 for course-work-only option.

##### **Course Work**

*Thesis option:* 28 hours of graduate course work required. At least 24 hours must be in ECE graduate courses, 12 of which must be 500-level ECE courses excluding ECE 595, 596, 597, 598, and 599. Up to 4 hours of non-ECE graduate course work, completed with prior department approval, may be applied toward the MS degree. A computer engineering (CE) student may fulfill part of the 500-level ECE course requirement by completing up to 4 hours of graduate course work at 500 level in the CS department excluding CS 595, 596, 597, 598, and 599.

*Course-work-only Option:* 40 hours of graduate course work required. At least 32 hours must be in ECE graduate courses, 16 of which must be 500-level ECE courses excluding ECE 595, 596, 597, 598, and 599. Up to 8 hours of non-ECE graduate course work, completed with prior department approval, may be applied toward the MS degree. A computer engineering (CE) student may replace up to 4 hours of 500-level ECE course work with 400-level ECE course work if the student completes the same number of hours of non-ECE course work at 500 level in the CS department excluding 595, 596, 597, 598, and 599.

##### *Additional Course Work Requirement:*

No more than one special topics course (ECE 594) may be counted toward the 500-level requirement. Credit earned in ECE 596 may not be applied toward the MS degree.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Students may elect either a thesis or courses-only option. No other options available.

*Thesis:* Thesis students must earn 8 hours in ECE 598; no more than 8 hours of ECE 598 may be applied toward the degree.

##### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 108 beyond the baccalaureate.

##### **Course Work**

*Student admitted with prior master's degree in EE, CE, or a related field:* Must complete a minimum of 28 hours of credit in graduate course work, 16 hours of which must be ECE course work at the 500 level excluding ECE 595, 596, 597, 598, and 599. A computer engineering (CE) student may replace up to 4 hours of 500-level ECE course work with 400-level ECE course work if the student completes the same number of hours of non-ECE course work at 500 level in the CS department excluding CS 595, 596, 597, 598, and 599. Any course that is nearly equivalent to one taken in a master's program earlier will not earn PhD credit. Credit earned in ECE 596 may not be applied toward the PhD degree.

*Student admitted directly after bachelor's degree in EE, CE, or related field:* Must complete a minimum of 52 hours of graduate course work, 36 hours of which must be ECE course work with at least 24 hours at the 500 level excluding ECE 595, 596, 597, 598, and 599. A CE student may replace up to 8 hours of 500-level ECE course work with 400-level ECE course work if the student completes the same number of hours of non-ECE course work at 500 level in the CS department excluding CS 595, 596, 597, 598, and 599. A student may apply to receive an MS degree upon passing the preliminary examination provided course work required for MS degree under course-work-only option is completed. If any one of the PhD degree requirements of passing the qualifying examination or passing the preliminary exam is not successfully completed, student may apply for transfer to the MS program for an opportunity to complete the MS degree requirements under the thesis option. Credit earned in ECE 596 may not be applied toward the PhD degree.

##### **Examinations**

*Departmental Qualifying Examination:* Required; written.

*Preliminary Examination:* Required; oral.

##### **Dissertation**

Required. Candidates must earn ECE 599 credit of at least 44 hours credit beyond master's degree and at least 52 hours beyond bachelor's degree.

##### **Financial Aid**

There are several different forms of financial aid available to incoming graduate students: university fellowship, teaching assistants, research assistants, and tuition and fee waivers. Applicants may seek financial aid by completing the downloadable *Application for Graduate Appointment* and mailing it to the ECE department at UIC. They will automatically be considered for all four forms of financial aid listed above. Additional information and the procedure to apply for financial aid can be found on the ECE home page by clicking on the Financial Aid link at <http://www.ece.uic.edu>.

#### **Geotechnical Engineering and Geosciences**

*Mailing Address:* Department of Earth and Environmental Sciences (MC 186), 845 West Taylor Street, Chicago, Illinois 60607-7059

*Campus Location:* 2440 SES

*Curriculum Code:* 1722

*Admission Code:* 20FS1290PHD

*Telephone:* (312) 996-3154

*E-mail:* [slf@uic.edu](mailto:slf@uic.edu)

*Program Coordinator:* Steven L. Forman

The Department of Civil and Materials Engineering, in cooperation with the Department of Geological Sciences, offers a coordinated program leading to the Doctor of Philosophy in geotechnical engineering and geosciences.

The Department of Civil and Materials Engineering also offers programs leading to degrees in civil engineering and materials engineering. The Department of Earth and Environmental Sciences also offers a program leading to the Master of Science in earth and environmental sciences. Consult the appropriate chapters in this catalog for more information.

##### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Geology, engineering, or a related field.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from professors familiar with the applicant's academic work.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 112 from the baccalaureate.

#### **Course Work**

Students must take at least 36 semester hours of didactic courses beyond the MS, including at least four 500-level courses in earth and environmental sciences and 10 semester hours in engineering. Five of the engineering hours must be in CEMM courses; the other five hours may be in other engineering departments.

#### **Examinations**

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required.

#### **Dissertation**

Required. Students must earn at least 44 hours in EaES 599.

### **Industrial Engineering**

*Mailing Address:* Department of Mechanical and Industrial Engineering (MC 251), 842 West Taylor Street, Chicago, Illinois 60607-7022

*Campus Location:* 2041 ERF

*Curriculum Codes:* 2722 (MS), 2822 (PhD)

*Admission Codes:* 20FS0127MS (MS); 20FS1338PHD (PhD)

*Telephone:* (312) 996-6122

*E-mail:* megrad@uic.edu

*Head of the Department:* William Worek

*Director of Graduate Studies:* Thomas Royston

*Associate Director of Graduate Studies:* Wei Chen

The Department of Mechanical and Industrial Engineering offers work leading to the Master of Science in industrial engineering and the Doctor of Philosophy in industrial engineering and operations research. Course work and research is available in such topics as computer-aided design and manufacturing, computer-aided process planning, optimization, quality control, industrial automation, safety engineering, and statistical modeling of manufacturing design. The department also offers a program leading to degrees in mechanical engineering at both the master's and doctoral levels; consult the appropriate chapter in this catalog for more information on this program.

### **Admission Requirements**

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Industrial engineering or a related curriculum. The degree must be from an American Board of Engineering Technology (ABET) accredited college or university or the equivalent.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. A grade point average of at least 3.50 is preferred for applicants to the PhD program.

*Tests Required:* International applicants are required to take the GRE. Applicants seeking a teaching or research

assistantship are strongly encouraged to take the GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

*Other Requirements:* Admission to the PhD program is not automatic for students completing their MS degree in the department. Master's students who desire to continue on to the PhD must see the department's graduate coordinator for forms to apply to the PhD program.

#### **Nondegree Applicants**

Nondegree applicants may be admitted for no more than 8 semester hours.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

**Minimum Semester Hours Required:** 36.

#### **Course Work**

*Course-work-only Option:* At least 36 hours must be in didactic courses. Twenty semester hours must be in courses in the department, of which at least 12 hours must be at the 500 level, excluding IE 596. IE 596 may be used to fulfill a 400-level course requirement. No more than 4 hours of IE 596 can be applied to the degree. A 400- or 500-level course may be taken in place of IE 596.

*Thesis Option:* At least 24 hours must be in didactic courses. Twenty semester hours must be in courses in the department, of which at least 12 hours must be at the 500 level, excluding IE 596 and IE 598. Twelve hours must be in IE 598.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* No more than 12 hours of IE 598 can be applied to the degree.

#### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 108 from the baccalaureate.

#### **Course Work**

At least 64 semester hours must be in graduate-level courses other than IE 599. At least 28 hours must be in 500-level courses, of which at least 16 hours should be in courses within the department. Students may take up to 12 semester hours of 500-level courses outside the department. The 64-hour course requirement includes a major, the scope of which is determined by the thesis advisor, and a minor of at least 16 semester hours, which may be taken outside the department. Students must take at least 8 semester hours of graduate courses offered by the Department of Mathematics; IE 471 and 472 may be counted as part of the math requirement.

Students who enter the program with a master's degree in their major area will be granted 12 semester hours of 500-level course credit from the 32 hours granted by the Graduate College for a prior master's degree.

#### **Examinations**

*Preliminary Examination:* Required; written.

#### **Dissertation**

Required. Students must earn at least 44 hours in IE 599. The main outline of the dissertation (PhD proposal review) must be presented to the dissertation committee at least one semester before the actual defense.

## Materials Engineering

*Mailing Address: Department of Civil and Materials Engineering (MC 246), 842 West Taylor Street, Chicago, Illinois 60607-7023*

*Campus Location: 2095 ERF*

*Curriculum Code: 3822*

*Admission Codes: 20FS1434MS (MS); 20FS1434PHD (PhD)*

*Telephone: (312) 996-3428*

*E-mail: mdoorey@uic.edu*

*Head of the Department: Farhad Ansari*

*Director of Graduate Studies: Michael McNallan*

The Department of Civil and Materials Engineering (CME) offers programs leading to the Master of Science and Doctor of Philosophy degrees in materials engineering. Study and research is available in the areas of ceramics, polymers, electronic materials, composites, welding and joining, solidification, corrosion, tribology, and processing.

The department also offers programs leading to degrees in civil engineering at both the master's and doctoral levels, and participates with the Department of Geological Sciences in offering a coordinated program leading to the Doctor of Philosophy in geotechnical engineering and geosciences; consult the appropriate chapters in this catalog for more information.

Updated information about the faculty, staff, curriculum, and courses is found on the CME home page at the following address: <http://www.uic.edu/depts/cme/cme.html>.

### Admission Requirements

Applicants are considered on an individual basis. Complete transcripts for all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Engineering or a related field.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Required for PhD applicants.

*Personal Statement:* Not Required.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 36.

##### Course Work

At least 24 hours must be in courses chosen from a list of major courses, which is available from the director of graduate studies. At least 12 hours must be at the 500 level, and at least 8 hours must be in 500-level didactic courses in the department. No more than 4 hours of CEMM 598 can be used to satisfy the 500-level course requirement.

##### Comprehensive Examination

None.

##### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

*Thesis:* No more than 12 hours of CEMM 598 can be applied to the degree.

#### Doctor of Philosophy

*Minimum Semester Hours Required:* 112 from the baccalaureate.

##### Course Work

Students must take at least four 500-level courses in the department, excluding CEMM 599.

## Examinations

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required.

## Dissertation

Required. Students must enroll in CEMM 599 for at least 44 semester hours.

## Mechanical Engineering

*Mailing Address: Department of Mechanical and Industrial Engineering (MC 251), 842 West Taylor Street, Chicago, Illinois 60607-7022*

*Campus Location: 2041 ERF*

*Curriculum Code: 3122*

*Admission Codes: 20FS0133MS (MS); 20FS0133PHD (PhD)*

*Telephone: (312) 996-6122*

*E-mail: megrad@uic.edu*

*Head of the Department: William Worek*

*Director of Graduate Studies: Thomas Royston*

*Associate Director of Graduate Studies: Wei Chen*

The Department of Mechanical and Industrial Engineering offers work leading to degrees in mechanical engineering at both the master's and doctoral levels. In addition, the department offers a program leading to the Master of Science in industrial engineering and the Doctor of philosophy in industrial engineering and operations research; consult the appropriate chapter in this catalog for more information.

Course work and research is available in such topics as fluid mechanics, stress analysis, mechanisms, dynamics and vibration, mechanical design, computer-aided design and manufacturing, heat transfer, mass transfer, combustion, multiphase flow and heat transfer, automatic control, industrial automation, and energy conversion. Interdisciplinary and interdepartmental work is encouraged, especially in the biological, environmental, electrical engineering, and computer science areas.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Mechanical engineering. The degree must be from an American Board of Engineering Technology (ABET) accredited college or university or equivalent.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. A grade point average of at least 3.50 is preferred for applicants to the PhD program.

*Tests Required:* International applicants are required to take the GRE. Applicants seeking a teaching or research assistantship are strongly encouraged to take the GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

*Other Requirements:* Admission to the PhD program is not automatic for students completing their MS degree in the department. Master's students who desire to continue on to the PhD must see the department's graduate coordinator for forms to apply to the PhD program.

### Nondegree Applicants

Nondegree applicants may be admitted for no more than 8 semester hours.

### Deadlines

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

## **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

### **Master of Science**

**Minimum Semester Hours Required:** 36.

Students may elect one of two options: course work only or thesis.

#### **Course Work**

*Course-work-only Option:* At least 36 hours must be in didactic courses. Twenty semester hours must be in courses in the department, of which at least 12 hours must be at the 500 level, excluding ME 596. ME 596 may be used to fulfill a 400-level course requirement. No more than 4 hours of ME 596 can be applied to the degree. A 400- or 500-level course may be taken in place of ME 596.

*Thesis Option:* At least 24 hours must be in didactic courses. Twenty semester hours must be in courses in the department, of which at least 12 hours must be at the 500 level, excluding ME 596 and ME 598. Twelve hours must be in ME 598.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* No more than 12 hours of ME 598 can be applied to the degree.

### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 108 from the baccalaureate.

#### **Course Work**

At least 64 semester hours must be in graduate-level courses other than ME 599. At least 28 hours must be in 500-level courses, of which at least 16 hours must be in the department. The 64-hour course requirement includes a major, the scope of which is determined by the thesis advisor, and a minor of at least 16 semester hours, which may be taken outside the department. Students must take at least 8 semester hours of graduate courses offered by the Department of Mathematics; ME 494 and 594 may count as part of the math requirement.

Students who enter the program with a master's degree in their major area are granted 12 semester hours of 500-level course credit from the 32 hours granted by the Graduate College for a prior master's degree.

#### **Examinations**

*Preliminary Examination:* Required; written.

#### **Dissertation**

Required. Students must earn at least 44 hours in ME 599. The main outline of the dissertation (PhD proposal review) must be presented to the dissertation committee at least one semester before the actual defense.



# College of Liberal Arts and Sciences

## Anthropology

*Mailing Address: Department of Anthropology (MC 027),  
1007 West Harrison Street, Chicago, Illinois 60607-7139*

*Campus Location: 2102 BSB*

*Curriculum Code: 0132*

*Admission Codes: 20FS0340MA (MA); 20FS0340PHD  
(PhD)*

*Telephone: (312) 413-3570*

*E-mail: kallison@uic.edu*

*Head of the Department: John Monaghan*

*Director of Graduate Studies: James Phillips*

The Department of Anthropology offers a program leading to degrees in anthropology at both the master's and doctoral levels. An interdepartmental concentration in gender and women's studies is available to students in this program, as well as an interdepartmental concentration in Latin American and Latino studies. The department has research laboratories supporting studies in archeology, sociocultural anthropology, linguistic anthropology, and physical anthropology. The department and the Field Museum of Natural History have a joint program whereby students can, under the direction of a curator, use the collections and facilities of the museum for research projects. Students interested in pursuing a course of study in the conservation of anthropological materials should contact faculty at the Field Museum.

## Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

### Master of Arts

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required preferably from former professors.

*Personal Statement:* Required. The statement should outline the applicant's professional goals.

### Doctor of Philosophy

*Prior Degrees:* Students may enter either with an anthropology MA or equivalent, from an accredited college or university, in the U.S. or abroad.

*Grade Point Average:* At least 3.00 (A=4.00) for the final semester hours (90 quarter hours) of undergraduate study.

*Tests required:* GRE scores are required.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three letters of recommendation addressing the applicant's academic accomplishments and potential.

*Personal Statement:* Required. A one page statement of academic and professional intent.

### Deadlines

The application deadline for applicants requiring funding is January 15.

## Degree Requirements

### Master of Arts

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 36.

### Course Work

*Required Courses:* Anth 500, 501, 502, 503, and 595.

Candidates must complete Anth 500, 501, 502, and 503 with grades of B or better and Anth 595 with an S. Courses must be completed within the first two semesters of the program.

*Electives:* All students must take an additional 12 hours in anthropology and at least four 500-level courses (not necessarily in anthropology).

### Comprehensive Examination

Required. The final examinations in Anth 500, 501, 502, and 503 constitute the four sections of the comprehensive examination.

### Thesis, Project, or Course-work-only Options

Project or course work only. No other options available.

### Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### Interdepartmental Concentration in Latin American and Latino Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

### Doctor of Philosophy

**Minimum Semester Hours Required:** 96 from the baccalaureate.

### Course Work

*Required Courses:* Anth 500, 501, 502, 503, and 595.

Candidates must complete Anth 500, 501, 502, and 503 with grades of B or better and Anth 595 with an S. Courses must be completed within the first two semesters of the program.

### Examinations

*Preliminary Examination:* Required; written.

### Dissertation

Required.

### Other Requirements

Students must demonstrate a reading knowledge of a research language.

### Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies

Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### ***Interdepartmental Concentration in Latin American and Latino Studies***

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward concentration electives. Doctoral students are encouraged, but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

### **Biological Sciences**

*Mailing Address: Department of Biological Sciences (MC 066), 845 West Taylor Street, Chicago, Illinois 60607-7060*

*Campus Location: 3250 SES*

*Curriculum Code: 3332*

*Admission Codes: 20FS1902DA (DA); 20FS1072MS (MS); 20FS1072PHD (PhD)*

*Telephone: (312) 996-2931*

*E-mail: gradbios@uic.edu*

*Head of the Department: Lon Kaufman*

*Director of Graduate Studies: Brian Nichols*

The Department of Biological Sciences offers work leading to the Doctor of Philosophy, the Doctor of Arts, and the Master of Science degrees in biological sciences. Areas of research include cell biology, development, ecology, evolution, genetics, molecular biology, neurobiology, and plant biology. An interdepartmental specialization in neuroscience is available to qualified PhD students.

#### **Admission Requirements**

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions. Prior academic work must include at least 26 semester hours in biological sciences beyond the introductory level, two semesters of organic chemistry, two semesters of physics, and mathematics through introductory calculus. Otherwise qualified applicants may be required by the department to remove specific course work deficiencies by enrolling in undergraduate classes during their first year.

**Grade Point Average:** At least 3.00 (A=3.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** GRE general. The GRE advanced test in either biology or biochemistry, cell and molecular biology is recommended, but not required.

**Minimum TOEFL Score:** 620 (paper-based); 260 (computer-based).

**Letters of Recommendation:** Three required, preferably from instructors who are familiar with the applicant's recent work.

**Personal Statement:** A one to three page statement of the applicant's professional goals and reasons for wishing to attend graduate school is required.

#### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

Two tracks are available, research or course work. (*Note: until further notice, no new students will be admitted to the course-work track.*)

#### **Research Track**

**Minimum Semester Hours Required: 32.**

#### **Course Work**

At least 22 credit hours of 400- and 500-level courses are required. A minimum of 9 credit hours of 500-level courses must be letter-graded courses, not project, thesis, independent study, or seminar courses which are S/U graded.

#### **Comprehensive Examination**

Required; oral.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

**Thesis:** At least 4 semester hours, but not more than 10 hours, of Bios 598 can be applied to the degree.

#### **Course-work Track**

**Minimum Semester Hours Required: 32.**

#### **Course Work**

At least 24 credit hours of 400- and 500-level courses are required. A minimum of 9 credit hours of 500-level courses must be letter-graded courses, not project, thesis, independent study, or seminar courses which are S/U graded.

#### **Comprehensive Examination**

Required; oral.

#### **Thesis, Project, or Course-work-only Options**

Project required. No other options available.

**Project:** Students must take at least 3 semester hours of BioS 597; no more than 5 hours of Bios 597 can be applied to the degree.

### **Doctor of Arts**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

At least 32 hours must be at the 500 level, including at least 8 hours in BioS 597 and at least 8 hours in 500-level courses in other natural sciences, mathematics, engineering, or physiology. Students must enroll in at least 24 hours in the Doctor of Arts program.

#### **Examinations**

**Preliminary Examination:** Required.

#### **Dissertation**

Required.

### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

At least 22 credit hours of 400- and 500-level courses are required. A minimum of 8 credit hours of 500-level courses must be letter-graded courses, not project, thesis, independent study, or seminar courses which are S/U graded.

#### **Examinations**

**Preliminary Examination:** Required.

### **Dissertation**

Required. Students must earn at least 32 hours in BioS 599.

### **Interdepartmental Specialization in Neuroscience**

In addition to meeting the above requirements, students pursuing a specialization in neuroscience must take Neus 580, 582, and 583, and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least two other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary exam.

## **Chemistry**

*Mailing Address: Department of Chemistry (MC 111), 845 West Taylor Street, Chicago, Illinois 60607-7061*

*Campus Location: 4500 SES*

*Curriculum Code: 0732*

*Admission Codes: 20FS0335MS (MS); 20FS0335PHD (PhD)*

*Telephone: (312) 996-3161*

*E-mail: chemgrad@uic.edu*

*Acting Head of the Department: Tim Keiderling*

*Director of Graduate Studies: Richard J. Kassner*

*Associate Director of Graduate Studies: Pierre Le Breton*

The Department of Chemistry offers work leading to degrees in chemistry at both the master's and doctoral levels. Study and research is available in analytical, inorganic, organic, physical, and theoretical chemistry, and in biochemistry.

### **Admission Requirements**

Applicants are considered on an individual basis. They are urged to contact the director of graduate studies prior to submitting a formal application. Complete transcripts of all undergraduate and any graduate course work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Chemistry or biochemistry. Other fields are considered on an individual basis.

*Grade Point Average:* At least 3.00 (A=4.00) in mathematics and science courses other than independent study or research courses. At least 2.75 for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE subject test in chemistry. Submission of the GRE general scores is recommended. All entering students take placement examinations. The placement examinations, which are at a level of typical terminal college courses, are offered in analytical, inorganic, organic, and physical chemistry, and in biochemistry. Students in the PhD program must show proficiency in three areas of their choice. Students in the MS program must show proficiency in inorganic, organic, and physical chemistry. A deficiency in an area must be remedied by taking an advanced undergraduate or a graduate-level course in the area.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

### **Nondegree Applicants**

Nondegree applicants must submit a transcript from their baccalaureate institution.

### **Degree Requirements**

The MS degree is not a prerequisite to the PhD degree in chemistry. In addition to the Graduate College minimum requirements, students must meet the following program requirements:

## **Master of Science**

**Minimum Semester Hours Required:** 32.

Students may elect one of three options: course work only, examination, or thesis.

### **Course Work**

For students in all options, at least 24 of the 32 hours must be within the Department of Chemistry. All courses from outside the Department of Chemistry must be approved by the Graduate Advising Committee. At least four lecture courses must be taken at the 500 level. No more than 8 semester hours of seminar or research courses may be applied to the master's degree. If research courses are used, a project report must be submitted.

Students in the course-work-only option must complete all course work for the master's degree within three semesters, excluding summers; those who fail to do so must then select one of the other two options.

### **Comprehensive Examination**

Required only for students who elect to pursue the examination option. These students must pass two cumulative examinations by the end of the second year.

### **Thesis, Project, or Course-work-only Options**

Thesis, course work only, or course work with examination. No other options available. Students who do not submit a thesis must fulfill the requirements of either the course-work-only or examination options.

## **Doctor of Philosophy**

Students seeking a PhD degree are encouraged to enter this program immediately after completion of their undergraduate studies. The MS degree is not a prerequisite to the PhD degree in chemistry.

**Minimum Semester Hours Required:** 96 from the baccalaureate.

### **Course Work**

At least 9 hours must be in lecture courses at the 500 level in the student's major area, and 3 hours must be in a chemistry lecture course at the 500 level (or 6 hours in lecture courses at the 400 level in one field) outside the student's major area. Students must meet the seminar requirements of their major within the program.

Students found to be deficient in specific areas of chemistry on the basis of placement examinations may have to complete additional courses.

### **Examinations**

*Preliminary Examination:* Required. Candidates must pass six cumulative examinations.

### **Dissertation**

Required.

## **Communication**

*Mailing Address: Department of Communication (MC 132), 1007 West Harrison Street, Chicago, Illinois 60607-7137*

*Campus Location: 1140 BSB*

*Curriculum Code: 4732*

*Admission Code: 20FS1113MA*

*Telephone: (312) 996-4460*

*E-mail: arojecki@uic.edu*

*Head of the Department: Steve Jones*

*Director of Graduate Studies: Andrew Rojecki*

The Department of Communication offers work leading to the Master of Arts in communication. An interdepartmental concentration in gender and women's studies is available to students in this program.

The department's goal is to produce scholars and researchers who will contribute to the growth of knowledge about communication, whether they work in academic or applied settings, and who will be critical consumers of communication research in those settings. Study and research is available in the general areas of intercultural



communication, and media studies. Necessarily, these areas of study are intertwined. The emphasis is on breadth and integration; inquiry in media studies, for example, ranges from journalism ethics to media effects, electronic media, and computer-mediated communication, while the study of intercultural communication may range from language and symbolic representation, to social inequality, racism, discourse analysis, and international media in cross-cultural settings. Students should develop, in consultation with their advisors, a program of study that best meets their personal and professional interests and also provides a rigorous and expansive understanding of new media and intercultural communication.

### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must also meet the following program requirements:

*Baccalaureate Field:* No restrictions. Applicants must have the equivalent of 20 semester hours of study in communication.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required, at least two of which must be of an academic nature.

*Personal Statement:* Required; 600 words. The statement should address the way in which graduate study in the department relates to the applicant's career or other aims.

*Other Requirements:* Students are usually admitted for the fall semester.

### **Nondegree Applicants**

Rarely accepted. Nondegree applicants must submit all credentials and meet the same admission requirements as degree applicants. Nondegree students may not take individual study courses.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must also meet the following program requirements: **Minimum Semester Hours Required: 32.**

#### **Course Work**

At least 20 hours (excluding thesis hours) must be at the 500 level. Credit in Comm 474 and Comm 498 cannot be applied to the degree. Students who receive more than one grade below B in their graduate course work, or four incompletes that have not been made up within the regulatory one term, will be dropped from the program.

*Required Courses:* Comm 500 and 501; and either Comm 502 or 503. Comm 500 must be taken before Comm 501 unless a petition for exception is granted.

*Electives:* No more than 8 hours may be taken in courses outside the department, except for students in the specialization in gender and women's studies. No more than 4 hours may be in Comm 596.

Students taking a 400-level course as an elective should note that additional work may be required by the instructor and higher standards will be applied than for undergraduate students.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* Students must earn at least 8 hours in Comm 598.

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Criminal Justice**

*Mailing Address:* Department of Criminal Justice (MC 141), 1007 West Harrison Street, Chicago, Illinois 60607-7140

*Campus Location:* 4022 BSB

*Curriculum Code:* 3832

*Admission Codes:* 20FS1137MA (MA); 20FS1137PHD (PhD)

*Telephone:* (312) 996-2383

*E-mail:* lfrohman@uic.edu; casillas@uic.edu

*Acting Chair:* Joseph L. Peterson

*Director of Graduate Studies:* Lisa Frohman

The Department of Criminal Justice offers work leading to the Master of Arts and the Doctor of Philosophy in criminal justice. The Masters of Arts is organized into four curricular areas that include: the nature and development of rules, rule-breaking behavior, rule application, and research methodology. It is designed for careers in research, evaluation, and criminal justice administration. An interdepartmental specialization in gender and women's studies is available to students in this program.

Building on the above general curricular areas, the Doctor of Philosophy degree offers additional course work in theory, substantive specialties, and research methods. Concentrations are offered in law and society, criminology, and organizations.

The Department of Criminal Justice also cosponsors, with the College of Pharmacy, a program leading to the Master of Science in forensic science; consult the appropriate chapter in this catalog for more information.

### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must also meet the following program requirements:

#### **Master of Arts**

*Baccalaureate Field:* Applicants must have a baccalaureate degree in criminal justice or a related field from an accredited college or university.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general. The combined verbal and quantitative scores on the GRE must be at least 1000.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from professors familiar with the student's recent work or, in the case of applicants with professional experience, from supervisors.



*Personal Statement:* Required; one page. The statement should address the applicant's reasons for wanting to take graduate work in criminal justice and the relationship of this advanced training to the applicant's professional and other goals.

*Other Requirements:* Applicants must submit a sample of their academic writing.

*Note:* In exceptional situations, students with GPAs less than 3.00 but higher than 2.75, or without strong backgrounds in the social sciences, may be admitted on limited status and will be required to remedy academic deficiencies before being admitted to regular status.

#### **Nondegree Applicants**

The department will consider applicants for nondegree status who hold a baccalaureate degree from an accredited college or university and meet the admission requirements of the Graduate College.

#### **Doctor of Philosophy**

*Baccalaureate Field:* Students may enter either with an MA or a BA. If applicants received their Criminal Justice MA from UIC, then they must have received a "high pass" (3.50) on their MA Comprehensive Exam.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, with a GPA of at least 3.25 in all graduate courses taken.

*Tests Required:* GRE scores (verbal, quantitative, and analytic) with a minimum combined verbal and quantitative score of 1000.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three letters of recommendation addressing the applicant's academic accomplishments and potential.

*Personal Statement:* Required. A statement of academic and professional goals.

*Other requirements:* An MA thesis or other major research paper; a writing sample (if applying with a BA only).

#### **Degree Requirements**

In addition to the minimum requirements of the Graduate College, students must meet the following program requirements:

##### **Master of Arts**

*Minimum Semester Hours Required:* 40.

##### **Course Work**

*Required Courses:* CrJ 500, 520, 540, 547, 560, 561, and 562.

*Electives:* 12 semester hours. Four hours must be from among the three CrJ signature seminars (CrJ 541, 546, and 548). Of the remaining eight hours, four hours must be at the 500 level. Thesis or project hours may substitute for eight hours of electives.

##### **Comprehensive Examination:**

Required.

##### **Thesis, Project, or Course-work-only Options**

Course work only (with comprehensive examination. No other options available.

##### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender

and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Doctor of Philosophy**

Students who have received a master's degree or its equivalent prior to being admitted to the doctoral program can receive up to 32 semester hours of credit toward the 96 hour requirement. Credit for other graduate work in a related field, whether taken at UIC or another institution, may be given on an individual basis. Students may earn up to 20 hours of credit for dissertation research in CrJ 599. Students admitted with a BA degree must complete both the MA and PhD requirements, which includes the MA comprehensive examination and either the thesis or project option. Students with an MA from other institutions must satisfy UIC criminal justice MA requirements. The graduate director will evaluate students' prior preparation and determine remedial work if necessary.

*Minimum Semester Hours Required:* 96 beyond the baccalaureate.

##### **Course Work**

*Required Courses:* CrJ 500, 520, 540, 547, 560, 561, 562, 564, and 570. Note: For CrJ 570, upon departmental approval an equivalent methods course may be taken either outside the department or as an independent study course in the department, dependent on the student's dissertation research.

*Electives, Areas of Concentration:* Upon successful completion of the core curriculum students are required to complete 40 additional hours, no more than 12 of which may be taken outside the department. This includes two CrJ signature seminars (selected from CrJ 541, 546, and 548) one of which coincides with the student's area of concentration. Signature seminars are courses within the areas of concentration that offer further inquiry into central questions in the discipline. Three areas of concentration are offered, each of which typically requires students to complete five additional courses in an area:

1. Law and Society, which examines the nature of formal and informal social norms, their development, use and variation across cultures, societies, and over time.
2. Criminology, which examines the theories of deviance, crime causation, criminal behavior, and explanations of rule-breaking from psychological, sociological, economic, and political perspectives.
3. Organizations, which explores organizations and agencies whose principal function is the application of law, and theories explaining practices of decision making and how organizations are created, maintain and develop resources, and relate to internal and external environments.

##### **Examinations**

*Departmental Qualifying Examination:* None.

*Preliminary Examination:* Required; written and oral.

*Dissertation:* Required.

#### **Earth and Environmental Sciences**

*Mailing Address:* Department of Earth and Environmental Sciences (MC 186), 845 West Taylor Street, Chicago, Illinois 60607-7059

*Campus Location:* 2440 SES

*Curriculum Code:* 1632

*Admission Code:* 20FS1174MS

*Telephone:* (312) 996-3154

*E-mail:* slf@uic.edu

*Head of the Department:* Neil Sturchio

*Director of Graduate Studies:* Steven L. Forman

The Department of Earth and Environmental Sciences offers work leading to the Master of Science degree in earth and environmental sciences. In addition, the department

participates with the Department of Civil and Materials Engineering in offering a cooperative program leading to the Doctor of Philosophy in geotechnical engineering and geosciences. Consult the appropriate chapter in this catalog for more information on this latter program.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Earth sciences, engineering, or a related field.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from professors familiar with the applicant's academic work. Letters of recommendation should be sent directly to the graduate director by the referee and not by the applicant.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 32.

#### **Course Work**

Twelve of the 32 hours must be in the student's major area, as set forth in the departmental graduate handbook. No more than 4 of these hours may be taken in EaES 596. Twelve additional hours must be taken in departmental courses from outside the major area. With departmental consent, 400- or 500-level courses outside the department may be taken to fulfill this requirement. At least 8 of the 32 hours must be in 500-level courses, not including EaES 598.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* No more than 8 hours of EaES 598 can be applied to the degree.

### **English**

*Mailing Address:* Department of English (MC 162), 601 South Morgan Street, Chicago, Illinois 60607-7120

*Campus Location:* 2000 UH

*Curriculum Code:* 1132

*Admission Codes:* 20FS0311MA (MA); 20FS0311PHD (PhD)

*Telephone:* (312) 413-2239

*E-mail:* nimrod@uic.edu

*Head of the Department:* Walter Benn Michaels

*Director of Graduate Studies:* Sharon Holland

The Department of English offers work leading to degrees in English at both the master's and doctoral levels.

Specializations are available in the general areas of English, American, and world literature written in English; creative writing; language, literacy, and rhetoric; and teaching of English (master's only).

An interdepartmental concentration in gender and women's studies and an interdepartmental concentration in Latin American and Latino studies are available to both master's and PhD students. The department also offers a program leading to the Master of Arts in linguistics/TESOL; consult the appropriate chapter in this catalog for more information.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements,

applicants must meet the following program requirements:

*Baccalaureate Field:* Applicants who intend to specialize in literature or the teaching of English must have an undergraduate major in English or the equivalent that includes a balanced program in English and American literature beyond the level of sophomore surveys. Applicants who intend to specialize in creative writing may have an undergraduate major or a graduate degree in any field, if they show substantial evidence of ability to complete the work in literature required for the degree in English.

Applicants who intend to specialize in language, literacy, and rhetoric may have an undergraduate or graduate degree in English, linguistics, or a related field of language study.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study and for all graduate work.

*Test Required:* GRE general.

*Minimum TOEFL Score:* 590 (paper-based); 243 (computer-based).

*Letters of Recommendation:* Three required, preferably from individuals acquainted with the applicant's recent academic, professional, or creative work.

*Personal Statement:* Required. Domestic applicants must submit a statement of about 500 words presenting their reasons for wanting to take graduate work in English at UIC and the relationship of this advanced training to professional and other goals. International applicants must submit a two- or three-page summary of their educational experience that emphasizes their work in English and American literature and language. They should conclude this summary with their reasons for wanting to do graduate work in the English department.

*Other Requirements:* All MA and PhD applicants must submit a sample of their written work of up to 30 pages appropriate to their proposed area of study. For creative writing, at least five poems, one or more stories, a chapter from a novel, or comparable work.

#### **Deadlines**

The application deadline for the PhD is January 1 preceding fall admission; February 1 is the deadline for the MA programs.

### **Degree Requirements**

*(The department is currently revising its curriculum. Check with the department Web page for changes in requirements.)*

#### **Master of Arts**

**Minimum Semester Hours Required:** 32.

#### **Course Work**

At least 12 of the 32 hours must be at the 500 level, and at least 24 of the 32 hours must be in the English department. Credit toward the MA is not given for any course in which the student receives a grade of less than B.

#### **Required Courses:**

Creative Writing—at least 12 and no more than 16 hours of creative writing workshops and at least 12 hours of 400- or 500-level courses in English or American literature, languages, and culture. No more than 8 hours of credit may be Engl 596 or 597.

Literature—Engl 497 and 503; at least one graduate course in each of the following areas in which the student has not passed an advanced undergraduate course with a grade of B or better: English literature from the beginnings through Milton, English literature from the Restoration through 1914, American literature from the beginnings through 1914, and British and American literature since 1914; at least one graduate seminar chosen from the following: medieval, Renaissance, 18th century, romantic, American to 1860; at least one graduate seminar chosen from the following: American since 1860, Victorian, modern British, special topics.

Teaching of English—Engl 501, 503, and 554; two courses in teaching, chosen from among Engl 481, 486, 555, and 556 and Ling 483, 554, and 583, one additional course in language, literacy, and rhetoric or linguistics; one additional course in literature; and one elective course. At least 4 hours must be taken in courses with a multicultural or cross-cultural orientation. Each student must submit a qualifying paper for departmental approval. It may be an enlarged version of a paper written for a course taken as a graduate student, or it may have originated in independent research. No more than 4 hours of Engl 597 may be applied to the degree.

Language, Literacy, and Rhetoric—Engl 501; two courses from one of the two following areas of coursework: Area I (Language) Engl 401, 485, or Ling 405 or Area II (Composition and Rhetoric) Engl 402, 483 or 484; one 400- or 500-level course in African-American, Asian-American, Latino, Native American, or multiethnic literature; one additional 400- or 500-level course in language, literacy, and rhetoric; one 500-level seminar; and two elective courses in English, linguistics, or the College of Education's reading, writing, and literacy area, or other department or program, with the consent of the advisor. One of these electives may be Engl 597.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project consisting of a qualifying paper required for all specializations. No other options available.

*Project:* Students in the specializations in literature; the teaching of English; and language, literacy, and rhetoric must submit a paper of 25–35 pages. No more than 4 hours of Engl 597 can be applied to the degree.

Creative writing students must submit a manuscript consisting of a substantial collection of their work.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

#### **Doctor of Philosophy**

*(The department is currently revising its curriculum. Check with the department Web page for changes in requirements.)*

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

Credit toward the PhD is not given for any course in which the student receives a grade of less than B.

*Required Courses:* Students in all specializations who have not had equivalent courses at the senior undergraduate or graduate levels must select one course from each of the following core areas. Language—Engl 400, 401, 403; Rhetoric—Engl 402; Literary Criticism—Engl 503.

#### *Specialization Courses:*

Language, Literacy, and Rhetoric—16 hours in language and rhetoric, including at least two seminars; 8 hours in literature and in criticism, scholarship, and theory, including one seminar.

Creative Writing—12 hours in creative writing; students working in fiction must take at least 8 of those hours in fiction workshops; students working in poetry must take at least 8 of those hours in poetry workshops; and 12 hours in literature and in criticism, scholarship, and theory, including one seminar.

Literature—Engl 478, 497, or 504; three seminars. Students in this specialization are expected to divide their hours beyond the core requirements between course work in periods that would strengthen their general background and course work in those periods or genres related to their chosen area. They are urged to take additional course work in language and rhetoric.

#### **Examinations**

*Preliminary Examination:* Required; written and oral.

#### **Dissertation**

Required. No more than 32 hours of Engl 599 can be applied to the degree. Candidates in language, literacy, and rhetoric write dissertations involving their own theoretical or empirical studies in language, literacy, or rhetoric or studies of instruction, curriculum design, and the administration of writing programs. Candidates for the doctorate in creative writing are expected to produce as a dissertation on of the following: a novel, a volume of short stories or poems, a play or group of plays, or a unified collection of essays. Candidates for the doctorate in literature write dissertations involving original research in literary criticism or history.

#### **Other Requirements**

*Language:* Students must present evidence of reading knowledge of a language other than English. Contact the director of graduate studies for more information.

*Teaching:* Students lacking teaching experience must take Engl 555 during their first year. All students must serve as teaching assistants for at least four semesters. All teaching assistants teach sections of Engl 160 and 161. Teaching assistants are often assigned to other lower-level courses in English appropriate to their specialization.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### ***Interdepartmental Concentration in Latin American and Latino Studies***

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward concentration electives. Doctoral students are encouraged, but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

### **Environmental and Urban Geography**

*Mailing Address: Department of Anthropology (MC 027), 1007 West Harrison Street, Chicago, Illinois 60607-7138*

*Campus Location: 2102 BSB*

*Curriculum Code: 1532*

*Admission Code: 20FS1238MA*

*Telephone: (312) 413-3570*

*E-mail: megand@uic.edu*

*Chair of the Department: Brian S. Bauer*

*Director of Graduate Studies: Gary Fowler*

The Department of Anthropology offers work leading to the Master of Arts in environmental and urban geography. The program has two major areas of study: (1) environmental analysis and monitoring, environmental behavior, and environmental management; and (2) urban geography, including the environmental impact of urbanization, industrial and commercial development, transportation, residential area analysis, and urban and regional structures. The department also offers work leading to master's and doctoral degrees in anthropology; consult the appropriate chapter in this catalog for more information.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 32.

#### **Course Work**

At least 9 hours must be in 500-level geography courses (excluding Geog 592 and 595). For students with an undergraduate geography major, at least 6 hours must be in cognate courses recognized by the student's faculty advisor as supporting the student's program of study.

*Required Courses:* Geog 595. Nonthesis students must take 8 semester hours in geographic information systems or cartography and remote sensing.

*Electives:* Nonthesis students must take five courses, including at least two 500-level seminars, to define a program major in either environmental or urban geography,

and one geography course outside their major area. No more than 8 hours may be taken in other disciplines by nonthesis students; outside courses must support the student's major.

### **Comprehensive Examination**

Required only for students who do not complete a thesis; written.

### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* Thesis students must earn at least 9 hours in Geog 596 and 598, of which at least 6 hours must be in Geog 598; no more than 9 hours of Geog 598 can be applied to the degree.

### **French**

*Mailing Address: Department of Spanish, French, Italian, and Portuguese (MC 315), 601 South Morgan Street, Chicago, Illinois 60607-7116*

*Campus Location: 1615 UH*

*Curriculum Code: 1332*

*Admission Code: 20FS0304MA*

*Telephone: (312) 996-3222*

*E-mail: carlap@uic.edu*

*Head of the Department: Christopher Maurer*

*Director of Graduate Studies: Margaret Miner*

The Department of Spanish, French, Italian, and Portuguese offers work leading to the Master of Arts in French. An interdepartmental concentration in gender and women's studies is available to students in this program. The department also offers work leading to a degree in Hispanic Studies; consult the appropriate chapter in this catalog for more information on this program.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* A substantial background in French literature is essential, as is fluency in written and spoken French.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from professors or others familiar with the applicant's recent academic work.

*Personal Statement:* Required; 250 words in French. The statement should address the applicant's reasons for wanting to take graduate work.

*Other Requirements:* Applicants must submit a sample of their academic writing in French.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 32.

#### **Course Work**

At least 12 of the 32 hours must be 500-level courses in the French section, excluding Fr 502 and Fr 596. At least 24 hours of course work must be taken in the French section; Fr 502 counts as a course outside of the section.

*Required Courses:* Fr 433; 4 hours from among Fr 415, 416, 417, 418, 419, 420, or 422; and 4 hours from among Fr 461, 462, 463 or 464.

### **Comprehensive Examination**

Required; written and oral.

### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.



### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Germanic Studies**

*Mailing Address: Department of Germanic Studies (MC 189), 601 South Morgan Street, Chicago, Illinois 60607-7115*

*Campus Location: 1524 UH*

*Curriculum Code: 5732*

*Admission Codes: 20FS1292MA (MA); 20FS1292PHD (PhD)*

*Telephone: (312) 996-3205*

*E-mail: gaiba@uic.edu*

*Head of the Department: Helga W. Kraft*

*Director of Graduate Studies: Dagmar C. G. Lorenz*

The Department of Germanic Studies offers the Master of Arts degree in modern Germanic studies. Master's students may develop focal areas in the fields of German literature, applied linguistics, film studies, studies in Jewish culture, gender studies, and German intellectual history.

The department also offers a collaborative doctoral degree in German through a joint program with the University of Illinois at Urbana-Champaign.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. A substantial background in German literature or culture is expected, as is proficiency in written and spoken German.

*Grade Point Average:* At least 3.00 (A=4.00) in all German courses and in the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* General GRE scores are mandatory for university fellowship candidates.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic work.

*Personal Statement:* Required; 250 words. The statement should address the applicant's purpose and goals.

*Other Requirements:* Applicants must submit a sample of their academic writing.

### **Nondegree Applicants**

Nondegree applicants must submit a transcript from their baccalaureate institution.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Arts**

*Minimum Semester Hours Required:* 32.

### **Course Work**

At least 12 hours must be at the 500 level. These courses will be chosen from Ger 511, 512, 513, 514, 515, 531, and 593. Ger 407 is required for students with a teaching assistantship.

### **Comprehensive Examination**

Required for students who do not complete a thesis; written and oral examinations administered by a committee of one exam coordinator and two other faculty members.

### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* Optional; requires a committee of a supervisor and two other faculty members. No more than 8 hours of Ger 598 can be applied to the degree.

### **Other Requirements**

All non-native-German students must pass the Zentrale Mittelstufenprüfung with the grade of "gut."

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 72 beyond the master's degree.

### **Course Work**

40 hours exclusive of credit for thesis research, with a minimum of 32 credits in Germanic studies.

### **Examinations**

*Preliminary Examination:* Required; written and oral.

### **Dissertation**

Required.

### **Other Requirements**

By the time of the dissertation defense, candidates must have taught the equivalent of three one-semester courses. Students must demonstrate a reading proficiency in two foreign languages other than German that are relevant to their plan of study. All candidates must spend one semester in residence on the Urbana campus. Check the University of Illinois at Urbana-Champaign catalog for requirements.

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

## Hispanic Studies

*Mailing Address:* Department of Spanish, French, Italian, and Portuguese (MC 315), 601 South Morgan Street, Chicago, Illinois 60607-7117

*Campus Location:* 1733 UH

*Curriculum Code:* 3432

*Admission Codes:* 20FS1312MA (MA); 20FS1312PHD (PhD)

*Telephone:* (312) 996-3236

*E-mail:* mexotic@uic.edu

*Head of the Department:* Christopher Maurer

*Director of Graduate Studies:* Anne J. Cruz

The Department of Spanish, French, Italian, and Portuguese offers work leading to degrees in Hispanic studies at both the master's and doctoral levels. The master's program offers two specializations: Hispanic literary studies and Hispanic linguistics, consisting of two concentrations: descriptive and theoretical linguistics and applied linguistics. At the doctoral level, specializations are available in Hispanic literatures and cultures, and in Hispanic linguistics, with two concentrations: descriptive and theoretical linguistics and second language acquisition. Interdepartmental concentrations in Latin American and Latino studies and in gender and women's studies are available to students in both the master's and doctoral programs. The department also offers work leading to the Master of Arts in French; consult the appropriate chapter in this catalog for more information on this program.

### Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### Master of Arts

*Baccalaureate Field:* Spanish or related field.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of study.

*Tests Required:* All applicants are urged to take the GRE.

*Language Proficiency:* Applicants must give evidence of proficiency in spoken and written formal standard Spanish.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Sample of Writing in Spanish:* Applicants are required to submit a sample of their written work in Spanish in the form of an essay for an academic course.

*Letters of Recommendation:* Three required from professors; at least two should be from instructors in upper-level or graduate Spanish courses.

*Personal Statement:* A statement of 250 words is required in which applicants should address their reasons for applying to a Spanish graduate program in the option selected.

#### Doctor of Philosophy

*MA or Equivalent:* Spanish or related field.

*Grade Point Average:* At least 3.00 (A=4.00) for all graduate courses.

*Tests Required:* Applicants are urged to take the GRE.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based). For applicants to SLA concentration, a minimum of 230 (computer-based) is required.

*Letters of Recommendation:* Three required; at least two from professors in graduate-level Spanish courses or equivalent.

*Personal Statement:* A 500-word statement addressing the applicant's purpose and goals.

*Other Requirements:* All applicants must present evidence of advanced knowledge of a modern Romance language in addition to Spanish and reading knowledge of one other ancient or modern language. The requirement for competence in foreign languages may be satisfied by evidence from the applicant's prior record (university

grades, supervised study in a foreign country, etc.) The requirement may also be satisfied by passing a proficiency test prior to the doctoral examination.

### Nondegree Applicants

Nondegree applicants must submit transcripts from all institutions where a degree or academic credit was earned during the last eight years.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Arts

*Minimum Semester Hours Required:* 36.

#### Course Work

*Required Course for All Specializations:* Span 502 or equivalent. All students must complete at least three courses at the 500 level besides any independent studies (Span 596).

#### Specialization Courses:

*Hispanic Literary Studies*—Eight elective courses (32 hours) chosen in consultation with the graduate advisor. At least one of the eight courses must be in linguistics other than Span 502, for a total of 36 hours.

*Spanish Descriptive and Theoretical Linguistics*—Span 402, 404, and 505, plus one other course at the 500 level other than Span 502, one course in literature, and three electives chosen in consultation with the graduate advisor, for a total of 36 hours.

*Spanish Applied Linguistics*—Span 402, 404, 453, or 556 and 507, plus one other course at the 500 level other than Span 502, and three electives chosen in consultation with the graduate advisor, for a total of 36 hours.

#### Comprehensive Examination

Required.

#### Thesis, Project, or Course-work-only Options

Thesis or course work only. No other options available.

*Thesis:* Permission of the department's graduate committee is required.

#### Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### Interdepartmental Concentration in Latin American and Latino Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

## **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

### **Course Work**

*Required for All Specializations:* Span 502 or equivalent.

**Hispanic Literature and Cultures**—A minimum of eight graduate courses (32 hours) of which three related to the field of study may be taken outside the department. A course in literary theory is required. It may be taken within or outside the department.

**Hispanic Linguistics**—For the concentration in Descriptive and Theoretical Linguistics, a minimum of eight graduate courses (32 hours), which should include Span 403 and 405. Three courses may be taken outside the department. At least two courses for the concentration must be in general linguistic theory.

**Second Language Acquisition**—A minimum of 10 courses (40 hours) distributed in three areas: SLA (Span 556, Span 557, and 2 other courses); Linguistics/Language Analysis (4 courses); and Research Methods (2 courses).

### **Examinations**

*Preliminary Examination:* Required; written and oral. The written exam will cover the area of specialization. The oral part of the exam will be based on the written sections and the dissertation prospectus submitted by the candidate.

### **Dissertation**

Required. No more than 28 hours of Span 599 can be applied to the degree. The dissertation should be based on original research in the candidate's specialization. The emphasis may be on any of the approaches covered by the areas of research (literary, linguistics, cultural).

### **Other Requirements**

Unless exempted by the director of graduate studies, all students must serve as teaching assistants for at least four semester hours and teach sections of elementary or intermediate Spanish.

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward concentration electives. Doctoral students are encouraged,

but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

## **History**

*Mailing Address:* Department of History (MC 198), 601 South Morgan Street, Chicago, Illinois 60607-7109

*Campus Location:* 913 UH

*Curriculum Codes:* 1932 (MA, PhD), 8032 (MAT)

*Admission Codes:* 20FS0342MA (MA); 20FS1757MAT (MAT); 20FS0342PHD (PhD)

*Telephone:* (312) 996-3141

*E-mail:* lindavp@uic.edu

*Chairperson of the Department:* Michael Perman

*Director of Graduate Studies:* Michael Alexander

The Department of History offers work leading to degrees in history at both the master's and doctoral levels. In addition to the regular master's degree program, the department offers a special program, designed to meet the needs of high school teachers, which leads to the Master of Arts in the Teaching of History (MAT). An interdepartmental concentration in gender and women's studies and an interdepartmental concentration in Latin American and Latino studies are available to both MA and PhD students.

Students must select one of the following major fields for the MA: Africa, ancient Mediterranean world, East Asia, medieval Europe, early modern Europe, modern Europe, Great Britain and Ireland, Russia, Latin America, and Colonial America and the United States. The PhD major fields are Africa, ancient Mediterranean world, medieval Europe, early modern Europe, modern Europe, Great Britain and Ireland, Russia, Latin America, Colonial America and the United States 1607 to 1877, and Colonial America and the United States since 1763. Each major field is further subdivided into minor fields, of which there are more than 160 for the MA and more than sixty for the PhD. Consult the department's graduate student handbook for more information.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Applicants must have either an undergraduate major in history or a minimum of 16 semester hours in history.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from former professors.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Arts**

**Minimum Semester Hours Required:** 32.

#### **Course Work**

Two tracks exist, one for students for whom this degree is intended to be final (the "MA-only track"), and one for whom this degree is intended to lead toward the Doctor of Philosophy in history (the "doctoral track").

At least 20 semester hours must be at the 500 level, and at least 16 semester hours must be in 500-level courses taught by the Department of History. Courses taken in a field other than history that are to count toward the degree need the approval of the advisor and the director of graduate studies.

Credit toward the degree is not given for any course in which the student received a grade of less than B.

**Required Courses:** 4 hours of the 500-level seminar in the student's major area. Students majoring in United States history must complete 8 hours of the section of Hist 551 designated as the historiographical/bibliographical colloquium. All entering graduate students are required to take Hist 501.

**Comprehensive Examination**

Required for students on MA-only track. Students on the doctoral track do not take master's comprehensive exams.

**Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

**Other Requirements**

Students must complete a seminar paper. Students must pass a reading examination in one foreign language relevant to the plan of study. Any additional foreign language (or skills in quantitative methods) requirement will be determined by faculty in the major field.

After the student has completed 24 hours of course work, a faculty committee representing the student's major and minor fields will review the record of each doctoral-track MA student in the final semester of her/his MA studies to decide whether it justifies the pursuit of doctoral studies. If the decision is negative, the student will be put on MA-only track, and will be required to take comprehensive examinations and fulfill all other requirements of the MA degree.

**Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

**Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

**Master of Arts in the Teaching of History**

**Minimum Semester Hours Required:** 32.

**Course Work**

At least 16 hours must be at the 500 level and in the field of history. Credit toward the degree is not given for any course in which the student receives a grade of less than B.

**Required Courses:** 8 hours of Hist 500. Students majoring in United States history must complete, in preparation for the comprehensive examination, 8 hours of the section of Hist 551 designated as the historiographical/bibliographical

colloquium. All entering graduate students are required to take Hist 501.

**Electives:** At least 8 semester hours in each of one major and two minor fields.

**Comprehensive Examination**

Required.

**Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

**Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

**Course Work**

Candidates must complete at least 64 semester hours of graduate work beyond the master's degree exclusive of Hist 501. Of this amount, 16 are in didactic courses, and 48 are in thesis research. Eight hours of didactic course work are in Hist 591, to be taken after all other requirements for didactic course work have been met. Credit toward the degree is not given for any course in which the student receives a grade of less than B. All entering graduate students are required to take Hist 501. PhD students are not required to repeat any specific course offered by this department that they have successfully completed as MA students. Students entering the PhD program with a master's degree from a department in another discipline may be required to complete additional hours of didactic course work, as appropriate and specified upon admission.

**Examinations**

**Comprehensive Examination:** None.

**Preliminary Examination:** Required; written.

**Dissertation**

Required.

**Other Requirements**

Students must pass a reading examination in one foreign language relevant to the plan of study. Any additional foreign language (or skills in quantitative methods) requirement will be determined by faculty in the major field.

**Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

**Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward



concentration electives. Doctoral students are encouraged, but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

## Linguistics

*Mailing Address: Department of English (MC 162), 601 South Morgan Street, Chicago, Illinois 60607-7120*

*Campus Location: 2004 UH*

*Curriculum Code: 2332*

*Admission Code: 20FS0301MA*

*Telephone: (312) 413-2240*

*E-mail: vdavis@uic.edu*

*Head of the Department: Walter Benn Michaels*

*Director of Graduate Studies: Elliot Judd*

The Department of English offers specializations in either general or applied linguistics leading to the Master of Arts in linguistics. Course work in general linguistics focuses on language, culture, and society; course work in applied linguistics focuses on TESOL (Teaching of English to Speakers of Other Languages). An interdepartmental concentration in gender and women's studies is available to students in this program. The department also offers a program leading to degrees in English at both the master's and doctoral levels; consult the appropriate chapter in this catalog for more information.

## Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirement, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work should include the equivalent of at least two years of a foreign language and a broad background in the humanities and social sciences. Training in mathematics or philosophy is also desirable. Applicants for the TESOL option may offer backgrounds in education rather than in the liberal arts.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* Applicants from countries where the primary language is not English must take the Test of Spoken English (TSE) in addition to the TOEFL. TSE tests were revised effective July 1, 1995. A TSE score of at least 50 is required for consideration.

*Minimum TOEFL Score:* 590 (paper-based); 243 (computer-based).

*Letters of Recommendation:* Three required. These must be sent directly to the department by professors who are familiar with the applicant's recent work.

*Personal Statement:* Required; 250 words. The statement should address the applicant's reasons for wishing to do graduate work in linguistics and the relationship of this work to the applicant's professional and other goals. Applicants who are not native speakers of English must submit a four-to five-page summary of their educational experience, emphasizing work in English and other literatures and languages and concluding with a statement of reasons for wanting to do graduate work in the United States; this replaces the 250-word statement required of other applicants.

## Nondegree Applicants

Nondegree applicants must submit a transcript from their baccalaureate institution.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* Varies by option. General linguistics, 32; applied linguistics: with thesis, 44; with internship, 49.

## Course Work

At least 12 hours must be at the 500 level.

*Required Courses:* Ling 415, 425, and 480.

Students in the general linguistics option must also take at least four courses from among the following: Ling 412, 420, 440, 453, 456, 459, 506, 551, 556, 559; Engl 400, 484, 485, 552, 553, 585, 586, 587; Anth 500, 501; and Phil 406, 519. Other courses focusing on language, culture, and society may be substituted with the permission of the advisor.

Students in the applied linguistics option must also take Ling 483, 531, 556, 583, 586, and one other TESOL or related course, to be approved by an advisor.

No more than one-fourth of the total hours required for the degree (excluding Ling 597 or 598) can be in independent study courses.

## Comprehensive Examination

Required; written. Students cannot take the examination more than twice.

## Thesis, Project, or Course-work-only Options

Thesis, project, or course work only (with internship).

A qualifying paper is required for general linguistics students. No more than 4 hours of Ling 597 can be applied to the degree in general linguistics. Students in applied linguistics/TESOL must complete either a thesis or an internship. They must earn 8 hours of Ling 598 for thesis research or 13 hours of Ling 594 for an internship.

## Other Requirements

All students must demonstrate proficiency in one foreign language either by examination or by completion (with a grade of B or higher) of appropriate course work beyond the second-year university level.

## Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

## Mathematics

*Mailing Address: Department of Mathematics, Statistics, and Computer Science (MC 249), 851 South Morgan Street, Chicago, Illinois 60607-7045*

*Campus Location: 339 SEO*

*Curriculum Codes: 2432 (DA, MA, MS, PhD), 2632 (MS in MISI), 7832 (MST)*

*Admission Codes: 20FS1901DA (DA); 20FS0439MA (MA); 20FS0439MS (MS); 20FS1439MS (MS in MISI); 20FS0290MST (MST); 20FS0439PHD (PhD)*

*Telephone: (312) 996-3041*

*E-mail: dgs@math.uic.edu*

*Head of the Department: Jerry Bona*

*Director of Graduate Studies: Charles Knessl*

The Department of Mathematics, Statistics, and Computer Science offers work leading to degrees in mathematics at both the master's and doctoral levels. Study and research is available in the general areas of pure mathematics, applied mathematics, probability and statistics, mathematical computer science, the teaching of mathematics, and an

integrated interdisciplinary curriculum combining mathematics, computer science, project management, and communication skills. Additional information, guidelines, and requirements are published annually in the department's *Graduate Handbook*.

All teaching assistants are required to take Math 589 (Teaching and Presentation of Mathematics) before or concurrently with their initial teaching assignments.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### **Master of Arts and Master of Science**

*Baccalaureate Field:* Mathematics or a related field. Applicants must have 20 semester hours of undergraduate work in mathematics beyond calculus. Additional requirements vary by area; contact the department for more information on the specific admission requirements of each area.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 3.00 in all mathematics courses beyond calculus.

*Tests Required:* GRE general and GRE subject test (in mathematics or in computer science, depending on the area of interest).

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic work.

*Personal Statement:* Required.

#### **Master of Science in Mathematics and Information Sciences for Industry**

*Baccalaureate Field:* Mathematics or related field. Applicants must have 20 semester hours of undergraduate work in mathematics beyond calculus. Contact the department for more information about specific admission requirements.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 3.00 in all mathematics courses beyond calculus.

*Tests Required:* GRE general and GRE subject test in mathematics or computer science.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic work.

*Personal Statement:* Required.

#### **Master of Science in Teaching of Mathematics**

*Baccalaureate Field:* Mathematics or a related field. Applicants for the secondary school option must have 20 semester hours of undergraduate work in mathematics beyond calculus, at least one course concerned with the problems of teaching secondary school mathematics, and the equivalent of the department's courses: Advanced Calculus II, Linear Algebra I, Abstract Algebra I.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 3.00 in all mathematics courses beyond calculus.

*Tests Required:* GRE general. Applicants for the secondary school option must also take the GRE subject test in mathematics; this test is suggested, but not required, for applicants for the elementary school option.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic work.

*Personal Statement:* Required.

*Other Requirements:* Applicants for the elementary school option must hold a valid K-8 Illinois Teaching Certificate or the equivalent.

### **Doctor of Arts and Doctor of Philosophy**

*Prior Degrees:* Completion of a master's program is required for entrance to the doctoral programs. MS students in the department who intend to continue on to the doctorate must satisfy the department's master's degree requirements and be recommended by the department for further work. Applicants who have a master's degree from another university must have completed an MS program equivalent to the department's. Applicants to the DA program who have an MST degree should complete the equivalent of the department's MS program.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 3.00 in all mathematics courses beyond calculus.

*Tests Required:* GRE general and GRE subject test in mathematics.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic work.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Arts and Master of Science**

*Minimum Semester Hours Required:* 32.

##### **Course Work**

At least 24 hours must be in mathematics courses, of which 12 hours must be at the 500-level. The student must complete a course of study in one of the following concentrations or, in exceptional cases approved by the Graduate Studies committee, a general program of study without concentration can be followed.

##### *Concentration in Pure Mathematics*

Students must take the following courses: Math 417, 516, 533 plus 4 hours from Math 446, 517, 534, 535, 536. *Other courses may be substituted with the permission of the director of graduate studies.* The remaining courses are selected in consultation with an advisor. Students must pass a written comprehensive examination in pure mathematics or write a thesis and pass an oral defense.

##### *Concentration in Applied Mathematics*

Students must take the following courses: Math 417, 481, 573 plus 8 hours from Math 578, 579, 580, 581. The remaining 12 hours must include previously listed courses or courses selected from the following groups: Applications-oriented Math—Math 574, 575, 576, 577, 584; Mathematical Science—Math 582, 583; Advanced Topics in Applied Mathematics—Math 590; Collateral Courses—MCS 472, 563, 572, 575; Advanced Undergraduate Courses—Math 419, 471, 484, Stat 401; selected 500-level courses in real or complex analysis or differential equations after consultation with an applied mathematics advisor.

*Other courses may be substituted with the permission of the director of graduate studies.* The remaining courses are selected in consultation with an advisor. Students must pass a written comprehensive examination in applied mathematics or write a thesis and pass an oral defense.

##### *Concentration in Mathematical Computer Science*

Students must take the following courses: MCS 401, 421, 471. Students must select at least three courses, two 500-level MCS courses plus one course selected from the MCS graduate-level course list or Stat 471. *Other courses may be substituted with the permission of the director of graduate*

*studies.* The remaining courses are selected in consultation with an advisor. Students must pass a written comprehensive examination in mathematical computer science or write a thesis and pass an oral defense.

*Concentration in Probability and Statistics*

Students must take the following courses: Stat 401, 411 plus one course selected from Stat 431, 461, 471, 477, 481. *Other courses may be substituted with the permission of the director of graduate studies.* The remaining courses are selected in consultation with an advisor. Students must pass a written comprehensive examination in probability and statistics or write a thesis and pass an oral defense.

*General Program of Study without Concentration*

Students following a program of study without concentration must receive prior approval from the graduate studies committee. Students must complete 24 hours of course work selected from the following: Math 417, 427, 430, 435, 436, 440, 442, 445, 446, 480, 481; MCS 401, 411, 418, 421, 423, 441, 471, 472; Stat 411, 416, 431, 461, 462, 471, 473, 481; any 500-level course except topics courses. *Other courses may be substituted with the permission of the director of graduate studies.* The remaining courses are selected in consultation with an advisor. Students must pass a written comprehensive examination in one of the four areas of concentration.

**Comprehensive Examination**

Optional. Students who do not pass a written comprehensive examination must complete a thesis.

**Thesis, Project, or Course-work-only Options**

Thesis or course work only (with written comprehensive examination). No other options available.

**Master of Science in Mathematics and Information Sciences for Industry**

**Minimum Semester Hours Required:** 32.

**Course Work**

*Required Courses:* MCS 401, 471, 504, 507, Math 589.

*Electives:* 12 semester hours chosen from the department's 500-level courses, with the exception of MthT courses.

**Comprehensive Examination**

None.

**Thesis, Project, or Course-work-only options**

Thesis or project required. No other options available.

**Master of Science in Teaching of Mathematics**

Two options (secondary and elementary) are available to MST students.

**Minimum Semester Hours Required:** Secondary option—32 hours; Elementary option—36 hours.

**Course Work**

*Required Courses:* Varies by option. Secondary option students must take MthT 410, 411, 510, and 530; and Math 425 or MthT 435. Elementary option students must take MthT 450, 460, 465, 470, 480, and 589.

*Electives:* The specific distribution of courses varies by option; contact the department for the specific requirements of each option.

**Comprehensive Examination**

None.

**Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

**Other Requirements**

Students in the secondary option must be eligible for a certificate to teach mathematics at the secondary level in Illinois. This requirement may be waived for candidates with teaching experience. If a candidate is not certified to teach mathematics at the secondary level in Illinois, up to 8 elective hours may be selected from courses in psychology or education, if taken at the graduate level. Certification may be earned before the MST degree is completed.

**Doctor of Arts**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

**Course Work**

At least 40 hours must be in mathematics, including 24 semester hours of regular 500-level courses. Mathematics courses must be chosen so that the areas of computer science, differential equations, geometry, logic, and probability and statistics are all represented.

*Required Courses:* Math 417, 445, 446, 516, 517, 533 and 534; 12 hours in education and math education, including Math 591 and 592; and 8 hours of graduate-level courses in an area of mathematics or a related science, such as physics, philosophy, history of science, or another science approved by the department.

*Electives:* Restricted to math and/or science. Courses in economics and statistical methods in psychology and education may, under certain conditions, be selected as electives.

**Examinations**

Students should pass the department's master's examination within one year of completion of 24 semester hours. Students who already have a master's degree upon entering the program must pass the examination within one year of entrance.

*Preliminary Examination:* Required.

**Dissertation**

Required. Students must earn at least 20 hours in Math 599.

**Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

**Course Work**

At least 40 hours must be in 500-level mathematics courses, excluding thesis research (Math 599, MCS 599, or Stat 599).

**Examinations**

*Preliminary Examination:* Required.

**Dissertation**

Required. Students earn at least 32 hours in thesis research (Math 599, MCS 599, or Stat 599).

**Other Requirements**

The language requirement for each student is decided by the Graduate Studies Committee. The determination is based on the student's area of interest. In no case will examination in more than one language be required. In those areas in which the primary sources are not in English, a foreign language may not be required.

**Philosophy**

*Mailing Address:* Department of Philosophy (MC 267), 601 South Morgan Street, Chicago, Illinois 60607-7114

*Campus Location:* 1421 UH

*Curriculum Code:* 2732

*Admission Codes:* 20FS0332MS (MS); 20FS0332PHD (PhD)

*Telephone:* (312) 996-3023

*E-mail:* val@uic.edu

*Chairperson of the Department:* W. D. Hart

*Director of Graduate Studies:* Walter Edelberg

The Department of Philosophy offers work leading to degrees in philosophy at both the master's and doctoral levels, and participates in the interdepartmental concentration in gender and women's studies.

**Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:



*Baccalaureate Field:* No restrictions. Prior academic work should include courses in modern formal logic, ethics, history of philosophy, epistemology, metaphysics, and philosophy of science.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None. The GRE is recommended.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from professors who are familiar with the student's recent work.

*Personal Statement:* Required; 250 words. The statement should address the applicant's past work in philosophy and plans for graduate study.

#### **Nondegree Applicants**

Applicants for nondegree status must submit transcripts to the department showing that they have a grade point average of at least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. Admitted nondegree students must have their selection of courses approved by the director of graduate studies before registering.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

##### **Master of Arts**

*Minimum Semester Hours Required:* 36.

##### **Course Work**

At least 24 hours must be in courses at the 500 level. At least 24 hours must be in courses in the Department of Philosophy, of which at least 20 must be at the 500 level (excluding Phil 590–599). Students must receive a B or better in one course in the history of philosophy; one course in metaphysics, epistemology, logic, philosophy of science, or philosophy of language; and one course in ethics, political philosophy, or aesthetics.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

##### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

##### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 96 for students entering with a baccalaureate, and 64 for students entering with a master's.

##### **Course Work**

Students must achieve a grade of B or better in each of fourteen regularly scheduled graduate courses by the end of their third year. At least ten of these must be at the 500 level or be 400-level logic courses; and at least ten must be in the Department of Philosophy. Phil 590 (research seminar) may not be counted more than once toward the fourteen.

*Required Courses:* A grade of B or better in each of the following courses: Phil 500; three 500-level courses in the history of philosophy (at least one in ancient and one in modern); five 500-level courses (except for logic courses, one of which may be at the 400-level) in (a) metaphysics or epistemology, (b) logic, philosophy of science, or philosophy of language, and (c) ethics or value theory, with at least one of the five courses in each of areas (a), (b), and (c). Phil 500, 593, 590, and 596 may not be used to satisfy these requirements. Third-year students may register for Phil 593 (Independent Research) to prepare for the departmental qualifying exam.

*Logic Requirement:* A grade of B or better in Phil 210 or above.

##### **Examinations**

*Departmental Qualifying Examination:* Required. The examination consists of a research paper and a written or oral exam within the student's general area.

*Preliminary Examination:* Required. Performance in courses, departmental qualifying examination, and teaching will be considered in determining whether the student passes the preliminary examination.

##### **Dissertation**

Required.

##### **Other Requirements**

The language requirement for each student is decided by a department committee of graduate faculty. The determination is based on a consideration of the student's area of interest. In no case is proficiency in more than two languages required. In those areas in which the primary sources are in English, a foreign language may not be required.

##### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Physics**

*Mailing Address:* Department of Physics (MC 273), 845 West Taylor Street, Chicago, Illinois 60607-7059

*Campus Location:* 2236 SES

*Curriculum Code:* 5432

*Admission Codes:* 20FS0240MS (MS); 20FS0240PHD (PhD)

*Telephone:* (312) 996-3400

*E-mail:* physics@uic.edu

*Head of the Department:* Inder Batra

*Director of Graduate Studies:* Christoph Grein

The Department of Physics offers work leading to degrees in physics at both the master's and doctoral levels. Experimental and theoretical work leading to a graduate degree is available in the general areas of: atomic, molecular, and laser physics; biophysics; condensed matter and materials physics; high-energy particle physics; and high-energy nuclear physics.

#### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts of all undergraduate and any graduate



work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work must include at least 20 semester hours of physics, including Phys 401, 421, and 441, or the equivalents.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general exam is required; GRE Physics subject exam is highly recommended, but not required.

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

#### **Nondegree Applicants**

Nondegree applicants must submit transcripts and a personal statement.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

##### **Master of Science**

*Minimum Semester Hours Required:* 32.

##### **Course Work**

At least 20 hours must be at the 500 level, of which no more than 4 hours may be in Phys 596. No more than 8 hours may be in Phys 598 if in thesis option.

*Required Courses:* Phys 501, 502, 511, and 512.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* No more than 8 hours of Phys 598 can be applied to the degree.

##### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 96 from the baccalaureate.

##### **Course Work**

At least 36 hours must be in 500-level courses other than Phys 596 and 599.

*Required Courses:* Phys 501, 502, 511, 512, and 561; and at least one complete sequence chosen from among the following: Phys 513 and 514, Phys 521 and 522, Phys 531 and 532, or Phys 551 and 552.

##### **Examinations**

*Departmental Qualifying Examination:* Required; oral.

*Preliminary Examination:* Required.

##### **Dissertation**

Required.

##### **Other Requirements**

Each student must serve as a teaching assistant for at least two semesters.

#### **Political Science**

*Mailing Address:* Department of Political Science (MC 276), 1007 West Harrison Street, Chicago, Illinois 60607-7137

*Campus Location:* 1119 BSB

*Curriculum Codes:* 3132 (MA), 4832 (PhD)

*Admission Codes:* 20FS0343MA (MA); 20FS0343PHD (PhD)

*Telephone:* (312) 996-8660

*E-mail:* getzov@uic.edu

*Head of the Department:* Lyn Ragsdale

*Director of Graduate Studies:* Barry Rundquist

The Department of Political Science offers work leading to the Master of Arts in political science and the Doctor of Philosophy in political science. An interdepartmental concentration in gender and women's studies and an

interdepartmental concentration in Latin American and Latino studies are available to students in these programs.

#### **Admission Requirements**

Applicants are considered on a competitive basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required, preferably from faculty members in political science or cognate disciplines who are familiar with the applicant's training and ability.

*Personal Statement:* Required. The statement should address the applicant's professional goals.

*Other Requirements:* Students are admitted only in the fall.

##### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for more information on current deadlines.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

##### **Master of Arts**

*Minimum Semester Hours Required:* 32.

##### **Course Work**

*Required Courses:* PolS 401, 505, and either PolS 460 or 541. Students who have previously taken equivalent course work may petition the director of graduate studies for a waiver of specific course requirements; no credit is given for a waived course.

*Electives:* At least 12 additional hours at the 500 level. No more than two courses (8 semester hours) may be taken outside the department.

##### **Comprehensive Examination**

Required only for students who do not complete a thesis.

##### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

*Thesis:* Students electing the thesis option must earn at least 8 hours in PolS 598.

*Course Work Only:* Comprehensive examination required.

##### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

##### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies

Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

*Required Courses:* PoLS 401, 500, 501, 504, 505, 506.

#### **Examinations**

*Preliminary Examination:* Required. After successful completion of the required course work, students, in conjunction with an advisor, will choose to be examined over two of five traditional subfields (urban politics, American politics, political theory, comparative politics, and international relations) and one group of related elective courses (institutions and processes; political economy and power; or identity, culture, and attitudes). The preliminary exam will consist of a written examination in each of the chosen areas.

#### **Dissertation**

Required. It is expected that students will submit a full statement of dissertation plans to the dissertation committee no later than the end of the second semester following passage of the preliminary exam. The dissertation prospectus will contain an analysis of the relevant literature, the theoretical issues to be addressed, the data to be used, the methods of analysis, and a statement of the anticipated significance of the research project. Students will not be authorized to proceed with dissertation research until their prospectus has been approved.

#### **Other Requirements**

In addition to the required courses, the student may also be requested to satisfy an advanced methodology requirement appropriate to the student's plan of study and approved by the director of graduate studies. Students whose plan of study will require reading or oral proficiency in a foreign language must pass an examination arranged by the department; course work required to prepare for this examination does not count toward the hours required for the degree.

*Faculty Review:* Within three semesters of entering the program students must demonstrate understanding of core materials by passing a faculty review based on a variety of student performance indicators, which may include progress and grades earned, seminar papers, and research interests.

Before taking the preliminary examination all students must complete an extensive research project. The paper will be evaluated by the project supervisor and one other member of the faculty who has been appointed by the director of graduate studies.

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, or independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward concentration electives. Doctoral students are encouraged, but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

### **Psychology**

*Mailing Address:* Department of Psychology (MC 285), 1007 West Harrison Street, Chicago, Illinois 60607-7137

*Campus Location:* 1066 BSB

*Curriculum Code:* 4032

*Admission Codes:* 20FS0338MA (MA); 20FS0338PHD (PhD)

*Telephone:* (312) 996-2434

*E-mail:* pschinfo@uic.edu

*Chairperson of the Department:* Christopher B. Keys

*Director of Graduate Studies:* Leonard S. Newman

The Department of Psychology offers work leading to the Doctor of Philosophy degree in psychology, with the Master of Arts degree earned as part of this program. The department's goal is to produce scholars and researchers who will contribute to the growth of psychological knowledge whether they work in academic or applied settings. Students must major in one of five divisions—biopsychology, clinical, cognitive, community and prevention research, and social and personality. All students must satisfy the requirements of their major division as well as an approved minor area. In addition to the major divisions, there are training opportunities in quantitative psychology, psychology and law, health psychology, preventive intervention and urban children's mental health, cognitive science, and disorders of development. Interdepartmental specializations in both neuroscience and educational psychology are available, as is an interdepartmental concentration in gender and women's studies. The framework of a student's program is determined by the major/minor combination that is selected. Within that framework, students in consultation with their advisors construct programs individually tailored to their research interests and career goals. The department also offers course work in instructional psychology and practicum opportunities to develop college-level teaching skills.

### **Admission Requirements**

The department accepts only applicants who wish to be candidates for the PhD. Applicants are not admitted as candidates for the MA as a terminal degree. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work must include the equivalent of 18 semester hours in psychology, including statistics and a laboratory course in experimental psychology, one year of college mathematics, and one year of laboratory courses in physical and/or biological sciences.

*Grade Point Average:* At least 3.20 (A=4.00) for the last 60 semester (90 quarter) hours of undergraduate work.

*Tests Required:* GRE general and GRE subject test in psychology. Verbal, quantitative, and subject test scores should be at least 600 each.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from faculty members, preferably psychologists, who are familiar with the applicant's training and ability. Information concerning an applicant's research experience and ability is especially pertinent.

*Personal Statement:* Required.

*Other Requirements:* Applicants must complete all forms contained in the department's application packet.

#### **Nondegree Applicants**

Rarely accepted. Nondegree applicants must submit all credentials and meet the same admission requirements as degree applicants. The department only accepts nondegree applicants who have exceptional credentials and who desire to take a few specific courses for professional purposes. Nondegree students may not take practicum or individual study courses. Nondegree students will not be admitted to the degree program at a later time.

#### **Deadlines**

Students may start the program only in the fall semester. Complete applications must be received by January 2.

### **Degree Requirements**

#### **Master of Arts**

*Minimum Semester Hours Required:* 32.

#### **Course Work**

At least 9 semester hours must be in one of the five divisions. The exact program will be established by the division.

*Required Courses:* Psch 543, 545, and 5 hours of Psch 591.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 96 from the baccalaureate.

#### **Course Work**

The specific distribution of courses will depend on the student's area of interest; students must complete the major of one of the five divisions as well as a minor requirement.

*Required Courses:* Psch 505, 543, and 545.

#### **Examinations**

*Preliminary Examination:* Required. The examination depends on the major and minor.

#### **Dissertation**

Required.

#### **Interdepartmental Specialization in Educational Psychology**

In addition to meeting the above requirements for the PhD in psychology, students pursuing a specialization in educational psychology must take Psch 517, 550, and 551 and an additional 8 hours of approved electives. At least 3 hours must be outside of psychology and at least 3 hours must be in educational measurement. They must submit the topic of their dissertation to the Committee on Educational Psychology for approval.

#### **Interdepartmental Specialization in Neuroscience**

In addition to meeting the above requirements for the PhD in psychology, students pursuing a specialization in neuroscience must take Neus 580, 582, and 583 and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least two other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary examination.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Slavic Languages and Literatures (PhD)**

*Mailing Address:* Department of Slavic and Baltic Languages and Literatures (MC 306), 601 South Morgan Street, Chicago, Illinois 60607-7116

*Campus Location:* 1628 UH

*Curriculum Code:* 4132

*Admission Code:* 20FS0302PHD

*Telephone:* (312) 996-4412

*E-mail:* slavbalt@uic.edu

*Acting Head of the Department:* Biljana Sljivic-Simsic

*Director of Graduate Studies:* Olga Nedeljkovic

The Department of Slavic and Baltic Languages and Literatures offers work leading to the PhD in Slavic languages and literatures. Specializations are available in Russian, Ukrainian, Polish, Serbian, and Lithuanian language and literature. An interdepartmental concentration in gender and women's studies is available to students in these five areas. The department also offers a program leading to the MA in Slavic studies; consult the appropriate chapter in this catalog for more information.

#### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Prior Degrees:* Applicants must have a master's degree from an accredited institution or the equivalent from a foreign institution. Students who enter with a master's degree or the equivalent from an institution other than UIC



or from another discipline may be granted limited standing until they pass a qualifying examination during the second term after admission as graduate students. Upon the recommendation of the examination committee, the examination may be retaken only once, and before the end of the third term.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study and for all graduate work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required; 300 words in the language of the applicant's intended area. The statement should summarize the applicant's scholastic experience and career objectives.

### **Degree Requirements**

*Minimum Semester Hours Required:* 64 from the master's degree.

#### **Course Work**

At least 44 hours (11 courses) must be in the student's major area, of which at least 28 hours (7 courses) must be at the 500 level. No more than 20 hours of Slav 599 can be applied to the degree.

Doctoral students in *Slavic literatures* will major in one Slavic literature of their choice and minor in another from a different Slavic language family (e.g., Polish and Serbian, Russian and Polish, or Ukrainian and Polish), complementing their literary training with sound preparation in both languages.

Doctoral students in *Slavic linguistics* will major in one Slavic language of their choice and minor in another from a different Slavic language family (e.g., Russian and Polish, or Polish and Serbian), complementing their linguistic training with sound preparation in the literatures of both areas.

Doctoral students in *Lithuanian literature* will major in Lithuanian literature and minor in a Slavic, Germanic, or Romance literature, complementing their literary training with sound preparation in the languages of both areas.

*Required Courses:* Students in the Slavic literatures and Slavic linguistics tracks must take Slav 505 (4 hours), and either Russ 510, Pol 510, Slav 510, or Slav 530 (depending on the student's major). Students in the Lithuanian literature track must take Lith 510 (4 hours).

*Electives:* In addition to the required courses, students must also take the following electives, which vary by specialization:

Slavic literatures—Six courses (24 hours) in the major literature; two courses (8 hours) in the minor literature; and one course (4 hours) in the major or minor language or Slavic linguistics.

Slavic linguistics—Four courses (16 hours) in the major language; two courses (8 hours) in the minor language; and three courses (12 hours) in the major literature or two courses (8 hours) in the major literature and one course (4 hours) in the minor literature.

Lithuanian literature—Six courses (24 hours) in Lithuanian literature; two courses (8 hours) in the minor literature; and two courses (8 hours) in Lithuanian language, general linguistics, and the minor language, of which at least one must be in the minor language.

With the concurrence of their advisor and the approval of the departmental graduate committee, doctoral students may substitute up to two courses (8 hours) in their major or minor with course work in another academic discipline relevant to their specific career goals.

#### **Examinations**

*Preliminary Examination:* Required. After at least one semester in residence, students select a major advisor from

the departmental graduate faculty in their area. When students have completed their course work and passed the reading proficiency test in French or German, the advisor and four additional members of the graduate faculty (at least four of whom must hold full membership in the Graduate College) will be appointed by the dean of the Graduate College on the recommendation of the departmental director of graduate studies to serve as a preliminary doctoral examination committee. The committee will ordinarily be chaired by the student's major advisor.

With the exception of the Lithuanian program, no more than two faculty members from outside the graduate faculty of the department may be invited to serve on an examining committee. The outside members must be distinguished scholars who currently hold tenured appointments and have graduate standing in a department with a PhD program. All invitations must be approved by the departmental graduate committee composed of all the graduate faculty members in the department.

The examining committee must be formally proposed by the student to the director of graduate studies no less than five weeks before the date planned for the preliminary examination.

#### **Dissertation**

Required. No more than 20 hours of Slav 599 can be applied to the degree. Students who have passed the preliminary exam and been admitted to doctoral candidacy must prepare and defend a doctoral dissertation produced under the guidance of a member of the department's graduate faculty, chosen by the candidate and approved by the director of graduate studies. The completed dissertation will be defended in an oral examination before a committee of at least five persons, of whom at least four must be full members of the graduate faculty. This committee (which will include the candidate's dissertation advisor) will be appointed by the dean of the Graduate College on the recommendation of the director of graduate studies and will ordinarily be chaired by the student's dissertation advisor.

#### **Other Requirements**

All doctoral students must demonstrate an adequate reading knowledge of either French or German before they attempt their written preliminary doctoral examination. Students in Lithuanian studies may elect Russian or Spanish instead of French or German.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Slavic Studies (MA)**

*Mailing Address:* Department of Slavic and Baltic Languages and Literatures (MC 306), 601 South Morgan Street, Chicago, Illinois 60607-7116

*Campus Location:* 1628 UH

*Curriculum Code:* 3532

*Admission Code:* 20FS1684MA

*Telephone:* (312) 996-4412



E-mail: [slavbalt@uic.edu](mailto:slavbalt@uic.edu)

Acting Head of the Department: Biljana Sljivic-Simsic

Director of Graduate Studies: Olga Nedeljkovic

The Department of Slavic and Baltic Languages and Literatures offers work leading to the MA in Slavic studies with specializations in Russian language and literature, Polish language and literature, Serbian language and literature, Ukrainian language and literature, Slavic linguistics, and Lithuanian language and literature. Students who desire to prepare for high school teaching but have not earned state certification during their undergraduate program can, in conjunction with their advisors, elect a program in either languages or literatures that would also include the additional course work required for certification. An interdepartmental concentration in gender and women's studies is available to students in this program. The department also offers work leading to the PhD in Slavic languages and literatures; consult the appropriate chapter in this catalog for more information.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** No restrictions. Applicants without a substantial background in Slavic or Baltic languages and literatures will be considered for admission on limited status only and required to remedy their deficiencies within a reasonable length of time before being granted full standing in the graduate program. Ordinarily an adequate background should include at least 9 semester (12 quarter) hours of upper division undergraduate work broadly pertinent to the applicant's intended graduate concentration and the level of fluency in the relevant Slavic or Baltic language equivalent to that attained in advanced conversation and composition courses offered by the department.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study and for all graduate work.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required; 300 words in the language of the applicant's intended specialization. The statement should summarize the applicant's scholastic experience and career objectives.

### **Degree Requirements**

**Minimum Semester Hours Required:** 36.

#### **Course Work**

**Required Courses:** Students in all areas of specialization are required to take the course on the structure of the language in their area (Russ 410, Pol 410, Slav 410, Slav 530, or Lith 410). Students who have taken such a course prior to enrolling in the MA program must substitute the appropriate 515 course.

**Electives:** In addition to the required course, students must take eight electives in their area of specialization, of which at least three must be at the 500 level. For literature majors, six courses (24 hours) must be in literature and two courses (8 hours) must be in linguistics. For language majors, five courses (20 hours) must be in linguistics and three courses (12 hours) must be in literature.

#### **Comprehensive Examination**

Required; written and oral.

#### **Thesis, Project, or Course-work-only Options**

Course work only. No other options available.

#### **Other Requirements**

Course work required for certification in high school teaching is in addition to the above departmental MA requirements.

### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

### **Sociology**

**Mailing Address:** Department of Sociology (MC 312), 1007 West Harrison Street, Chicago, Illinois 60607-7140

**Campus Location:** 4112 BSB

**Curriculum code:** 4332

**Admission Codes:** 20FS0344MA (MA); 20FS0344PHD (PhD)

**Telephone:** (312) 996-3005

**E-mail:** [gradsoc@uic.edu](mailto:gradsoc@uic.edu)

**Head of the Department:** William P. Bridges

**Director of Graduate Studies:** John Walsh

The Department of Sociology offers work leading to degrees in sociology at both the master's and doctoral levels. Course work and research leading to a graduate degree is available in general or applied sociology at the MA level, and sociology of health and illness; work, labor markets and organizations; race and ethnicity; and international/comparative/Asian societies at the PhD level. An interdepartmental concentration in gender and women's studies and an interdepartmental concentration in Latin American and Latino studies are available to students in this program.

### **Admission Requirements**

Applicants are considered on an individual basis. Complete transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### **Master of Arts**

**Baccalaureate Field:** No restrictions. Prior work in social science and sociology is recommended.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 3.50 for any previous graduate work.

**Tests Required:** GRE general test.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required from former professors or others best able to judge the applicant's aptitude and potential for sociological research.

**Personal Statement:** Required.

#### **Doctor of Philosophy**

**Prior Degrees:** A master's degree in sociology or equivalent is required. Doctoral applicants who do not already have a master's degree in sociology will obtain a master's degree as they complete requirements for the doctorate.

**Grade Point Average:** At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 3.50 for any previous graduate work.

**Tests Required:** GRE general test.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required; at least two should be from professors at the university where the master's degree was obtained.

*Personal Statement:* Required.

### **Degree Requirements**

#### **Master of Arts**

**Minimum Semester Hours Required:** 32–40, depending on the student's level of preparation.

#### **Course Work**

*Required Courses:* Soc 401, 402, 500, and 501; one course in sociological theory (e.g., Soc 485, 487, or 488); one course in social organization (e.g., Soc 441 or 447); and one course in social psychology or population (e.g., Soc 410, 451, 471, or 473). Students may petition the graduate committee to apply up to 8 hours of comparable course work taken prior to admission toward the course requirements in sociological theory, social organization, and social psychology or population.

*Electives:* Two 4-hour, 500-level seminars in sociology, excluding Soc 593 and 595. Students may petition the graduate committee to apply one seminar taken outside the department to the sociology seminar requirement. In this case, a 3-hour seminar may count toward this requirement.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Project or course work only. No other options available.

*Project:* Students must earn at least 4 hours in Soc 597.

#### **Other Requirements**

Applied sociology students must complete an internship.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration.

#### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 40–48 hours of course work beyond the MA; 16–24 dissertation research hours. The minimum number of hours beyond the baccalaureate is 96.

#### **Course Work**

*Required courses:* MA in sociology course requirements (32–40 hours depending on the student's level of preparation). Students with an MA from another institution must satisfy UIC sociology MA requirements. The graduate director will evaluate student's prior preparation and performance in satisfying these requirements.

Soc 509 (Seminar: Sociological Research Methods) is required.

16 hours of 500-level seminars which may include Soc 509. (These are in addition to the 8 hours of 500-level seminars required for the MA) Depending on specialty requirements, these may include seminars outside the department. Students choosing one major specialty must complete 16 hours in that specialty. Students choosing a major specialty and a minor specialty must complete 12 hours in the major and 8 hours in the minor. Students should consult the department for current requirements in each specialty.

Remaining hours shall be chosen in consultation with the student's advisor.

#### **Examinations**

*Departmental Qualifying Examination:* None.

*Preliminary Examination:* Required. The examination is comprised of an examination in a major specialty (or in a major and a minor specialty) and defense of the dissertation proposal.

#### **Dissertation**

Required.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

#### **Interdepartmental Concentration in Latin American and Latino Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in Latin American/Latino studies. Students must take at least 16 hours of course work approved by the student's advisor for the concentration, of which 4 hours must be the core seminar LALS 501. The remaining 12 hours may come from courses offered by the Latin American/Latino Studies Program or cross-listed courses, departmental offerings with Latin American or Latino content, independent study courses chosen in consultation with the advisor. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multidisciplinary nature of the concentration. Doctoral students may not apply dissertation credit (599) toward concentration electives. Doctoral students are encouraged, but not required, to elect a dissertation topic related to Latin America or Latinos in the United States.

# College of Medicine

## Anatomy and Cell Biology

*Mailing Address: Department of Anatomy and Cell Biology (MC 512), 808 South Wood Street, Chicago, Illinois 60612-7308*

*Campus Location: 578 CME*

*Curriculum Code: 0038*

*Admission Codes: 20FS1024MS (MS); 20FS1024PHD (PhD)*

*Telephone: (312) 996-6791*

*E-mail: conwell@uic.edu*

*Head of the Department: Scott T. Brady*

*Director of Graduate Studies: Conwell Anderson*

The Department of Anatomy and Cell Biology offers work leading to degrees in anatomy and cell biology at both the master's and doctoral levels. Areas of study include cell biology, neurobiology, and developmental biology. There is a strong emphasis on interdisciplinary studies that examine the relationship between structure and function. Research leading to a graduate degree is available in the following areas: neurobiology of the synapse, axonal transport, cytoskeleton, and response to stress; sensory systems; neuroplasticity; and cell motility. An interdepartmental specialization in neuroscience is available to doctoral students.

### Admission Requirements

Applicants are considered on an individual basis. Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Biology or a closely related field. Students who have majored in other fields may be admitted if they show substantial evidence of ability to complete the program.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement must address the applicant's research interests and career goals.

*Other Requirements:* Preference for admission is given to students who intend to complete a doctoral program.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 32.

#### Course Work

All students must take or show proficiency in Anat 403, 439, 440, and 442, and a 400-level course in biochemistry. At least 10 semester hours must be in 500-level didactic courses, of which 6 hours must be in the department and 4 hours must be from other departments.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

#### Other Requirements

All graduate students must serve as laboratory teaching assistants one year.

#### Doctor of Philosophy

*Minimum Semester Hours Required:* 96 from the baccalaureate.

#### Course Work

All students must take or show proficiency in Anat 403, 439, 440, and 442; a 400-level course in biochemistry; and PhyB 401 and 402. At least 10 semester hours must be in 500-level didactic courses, of which 6 hours must be in the department and 4 hours must be from other departments.

#### Examinations

*Preliminary Examination:* Required; written and oral.

#### Dissertation

Required.

#### Other Requirements

All graduate students must serve as laboratory teaching assistants each year.

#### Interdepartmental Specialization in Neuroscience

In addition to meeting the above requirements, students pursuing the interdepartmental specialization in neuroscience must take Neus 580, 582, and 583 and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least two other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary examination.

## Biochemistry and Molecular Biology

*Mailing Address: Department of Biochemistry and Molecular Biology (MC 536), 1819 West Polk Street, Chicago, Illinois 60612-7334*

*Campus Location: A312 CMW*

*Curriculum Code: 1038*

*Admission Codes: 20FS1044MS (MS); 20FS1069PHD (PhD)*

*Telephone: (312) 996-7670*

*E-mail: biochem@uic.edu*

*Head of the Department: Donald A. Chambers*

*Director of Graduate Studies: Karen Colley*

The Department of Biochemistry and Molecular Biology offers work leading to the Master of Science and Doctor of Philosophy degrees in biochemistry and molecular biology, and participates in the MD/PhD and DDS/PhD joint degree programs. The department has active, well-funded research programs in the molecular biology of growth and development, oncogenesis, metabolic regulation, macromolecular structure and function, signal transduction, and the biochemical basis of diseases. An interdepartmental specialization in neuroscience is available to doctoral students.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work should include 16 semester hours of chemistry (including organic chemistry, physical chemistry, and quantitative analysis), at least one advanced course in biology, and 6 semester hours of formal course work at the college level in French, German, Russian, or Spanish.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general. Subject test recommended but not required.

*Minimum TOEFL Score:* 570 (paper-based); 230 (computer-based).

*Letters of Recommendation:* Required.

*Personal Statement:* Required.



### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

**Minimum Semester Hours Required:** 32.

##### **Course Work**

Two tracks (thesis and nonthesis) are available to students in this program.

**Required Courses:** Bche 460, 520, 561 or 562; two semesters of 595; and 598. Students enrolled in the nonthesis track must also take Bche 521 and *both* Bche 561 and 562, and are not required to take 598 (note that students enrolled in the thesis track take *either* Bche 561 or 562).

**Electives:** Must include at least 2 additional 500-level courses, the choice of which must be approved by the department's graduate committee.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Thesis or course work only. No other options available.

**Thesis:** Thesis students must earn at least 12 semester hours in Bche 598.

##### **Other Requirements**

Supervised part-time teaching experiences during one term of each year are regularly assigned to students in the program.

#### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

##### **Course Work**

**Required Courses:** BChe 460, 520, 521, 522, 561, 562, 563, seven semesters of 595, and 599.

**Electives:** Must include at least two additional 500-level courses in related disciplines, the choice of which must be approved by the department's graduate committee.

##### **Examinations**

**Preliminary Examination:** An oral examination that includes written and general knowledge components is required.

##### **Dissertation**

Required.

##### **Other Requirements**

Supervised part-time teaching experiences during one term of each year are regularly assigned to students in the program. The department requires every degree candidate to fulfill teaching assignments, regardless of the source of financial support for the student.

##### **Interdepartmental Specialization in Neuroscience**

In addition to meeting the above requirements, students pursuing a specialization in neuroscience must take Neus 580, 582, and 583 and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least two other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary examination.

### **Health Professions Education**

**Mailing Address:** Department of Medical Education (MC 591), 808 South Wood Street, Chicago, Illinois 60612-7309

**Campus Location:** 986 CME

**Curriculum Code:** 1438

**Admission Code:** 20FS1306MHPE

**Telephone:** (312) 996-3590

**E-mail:** bordage@uic.edu

**Head of the Department:** Leslie J. Sandlow

**Director of Graduate Studies:** Georges Bordage

The Department of Medical Education offers a program of studies leading to the Master of Health Professions Education (MHPE) degree. The purpose of the MHPE program is to provide the training necessary to produce effective leaders in health professions education. Disciplinary and interdisciplinary offerings are available on topics related to curriculum, competence assessment, program evaluation, primary care education, clinical decision making, medical informatics, medical humanities, health care finance and organization, and management and leadership in health professions education.

### **Admissions Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

**Baccalaureate Field:** Applicants must hold a baccalaureate degree or an advanced professional degree in a health professions discipline.

**Grade Point Average:** At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 550 (paper-based); 213 (computer-based).

**Letters of Recommendation:** Three required.

**Personal Statement:** Required. The statement should address the applicant's professional goals.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 32.

##### **Course Work**

**Required Courses:** MHPE 501, 502, 503, and 504.

Students who elect the project option must also take 4 semester hours in a content area related to their project.

##### **Comprehensive Examination**

None.

##### **Thesis, Project, or Course-work-only Options**

Thesis or project. No other options available.

**Thesis:** Thesis students must earn at least 6 hours in MHPE 598; no more than 10 hours of MHPE 598 can be applied to the degree.

**Project:** Students who elect the project option must earn at least 4 hours in MHPE 597; no more than 6 hours of MHPE 597 can be applied to the degree.

### **Microbiology and Immunology**

**Mailing Address:** Department of Microbiology and Immunology (MC 790), 835 South Wolcott Avenue, Chicago, Illinois 60612-7344

**Campus Location:** E-704 MSB

**Curriculum Code:** 2538

**Admission Codes:** 20FS1468MS (MS); 20FS1468PHD (PhD)

**Telephone:** (312) 996-9477

**E-mail:** mimi@uic.edu

**Head of the Department:** Bellur Prabhakar

**Director of Graduate Studies:** David S. Ucker

The Department of Microbiology and Immunology offers work leading to the Master of Science and the Doctor of



Philosophy degrees. The department carries out basic research in the areas of immunology, virology, and microbial molecular biology. Research leading to a graduate degree is available in the general areas of molecular, cellular, and tumor immunology; molecular biology and genetics of prokaryotes; and molecular biology of eucaryotic cells and viruses.

### **Admission Requirements**

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Applicants must have a solid background in biology and inorganic and organic chemistry, and at least one year of physics and mathematics.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. Preference is given to applicants who have a GPA greater than 3.00.

*Tests Required:* GRE general. This test should be taken prior to submission of the formal application. Preference is given to applicants with a combined verbal, quantitative, and analytical score above 1800.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Required.

*Personal Statement:* Required.

*Other Requirements:* Preference is given to applicants with a documented record of research accomplishment who intend to complete the doctoral program.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

*Minimum Semester Hours Required:* 34.

#### **Course Work**

*Required Courses:* MIm 455, 551, 553, and 560; two hours of MIm 595; and BChe 460.

*Electives:* At least 3 semester hours must be in 500-level didactic courses in the department (not including MIm 553 and 560).

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

*Thesis:* Students must register in MIm 598 for 9 semester hours.

#### **MD/MS**

Medical students who have performed satisfactorily in their courses in immunology, microbiology, and biochemistry may pursue a joint program toward the MS degree in microbiology and immunology by taking 6 hours of MIm 455, 2 hours of MIm 595, 3 hours of regularly scheduled 500-level microbiology courses, and fulfilling the thesis requirement.

#### **Doctor of Philosophy**

*Minimum Semester Hours Required:* 96 from the baccalaureate.

#### **Course Work**

*Required Courses:* In addition to the courses required for the master's degree, doctoral students must take three additional hours of MIm 455, two additional hours of 500-level MIm didactic courses, three additional hours of didactic courses outside the department, four additional hours of MIm 595, and 52 semester hours of MIm 599.

*Electives:* At least 2 semester hours must be in 500-level didactic courses in the department (not including MIm 553 and 560) and 3 semester hours must be in didactic courses outside the department.

### **Examinations**

*Preliminary Examination:* Required.

### **Dissertation**

Required. Students must earn at least 52 hours in MIm 599.

### **Other Requirements**

During the second year of graduate study students must conduct a satisfactory oral defense of a written research proposal that is different from their thesis subject.

All graduate students, regardless of their means of financial support, must participate in the teaching programs of the department for one semester of each academic year. This requirement includes experiences in laboratory instruction, lecturing, and audiovisual presentations.

### **MD/PhD**

Students with an MD degree earned in the United States or who are working toward one at UIC may use medical science courses to fulfill the 400-level course requirements in immunology, microbiology, and biological chemistry. Such students must take 3 semester hours of MIm 455, 5 semester hours of 500-level courses in the department (in addition to the required courses, MIm 553 and 560), 3 semester hours of collateral 500-level courses, 6 semester hours of MIm 595, and 59 semester hours of MIm 599.

### **Molecular Genetics**

*Mailing Address:* Department of Molecular Genetics (MC 669), 900 South Ashland Avenue, Chicago, Illinois 60607-7170

*Campus Location:* 2150 MBRB

*Curriculum Code:* 4038

*Admission Code:* 20FS1477PHD

*Telephone:* (312) 996-6984

*E-mail:* phyllisg@uic.edu

*Interim Head of the Department:* Elliot R. Kaufman

*Directors of Graduate Studies:* Kiranur N. Subramanian and Lester F. Lau

The Department of Molecular Genetics offers a program of study leading to the Doctor of Philosophy in molecular genetics. Research leading to a graduate degree is available in somatic cell and human genetics; cytogenetics; genetics of *Drosophila* and yeast; genome mapping; gene transfer and expression; replication, recombination, and repair of DNA; unusual DNA structures and their functions; molecular biology of differentiation and development; mechanisms of mutagenesis; molecular biology and cell growth; cell cycle regulation and programmed cell death; molecular biology of oncogenes and tumor suppressor genes, multidrug resistance in cancer; genetic suppression elements; gene amplifications; transgenic mouse models for human diseases; nucleotide metabolism; and gene structure, function and regulation.

### **Admission Requirements**

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Biological, chemical, or physical sciences. Prior academic work should include mathematics; two or three years of chemistry, including biochemistry; one year of physics; and two years of biology including genetics. Individuals deficient in one or more of these areas may be admitted upon the condition that deficiencies be remedied by taking appropriate course work.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

*Required Courses:* 24 hours of didactic courses, including Gene 502, 512, 513, and 514, and Bche 460 and 562 to be completed in the first two years. Ten (10) hours of Gene 503 and one hour of Gene 501 are to be completed in the first year. One hour each of Gene 515 and Gene 595 are to be taken throughout the program.

*Electives:* To be taken by the student in consultation with his/her thesis advisor.

#### **Examinations**

*Preliminary Examination:* Required; oral. To be taken at the end of the spring semester of the second year.

#### **Dissertation**

Required. Students must register in Gene 599 each semester. Dissertation must contain results from original investigations and should be of a quality to merit publication in well-recognized scientific journals.

#### **Other Requirements**

During the fall and spring semesters of the first year, as part of Gene 503, students will complete internships in three different laboratories in the Department of Genetics to become acquainted with basic research methodologies and the research programs of various faculty members and to enable them to select their thesis advisors at the end of the spring semester of the first year.

### **Pharmacology**

*Mailing Address:* Department of Pharmacology (MC 868), 835 South Wolcott Avenue, Chicago, Illinois 60612-7343

*Campus Location:* E-403 MSB

*Curriculum Code:* 6538

*Admission Codes:* 20FS1564MS (MS); 20FS1564PHD (PhD)

*Telephone:* (312) 996-7635

*E-mail:* rskidgel@uic.edu

*Head of the Department:* Asrar B. Malik

*Director of Graduate Studies:* Randal A. Skidgel

The Department of Pharmacology offers work leading to degrees in pharmacology at both the master's and doctoral levels and participates in the MD/PhD dual degree program. An interdepartmental specialization in neuroscience is also available. The department is particularly strong in research on signal transduction, vascular biology, inflammation, cardiovascular pharmacology, and neuropharmacology. Research in these areas is pursued at the molecular, cellular, organ-system, and whole-animal levels of investigation.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work should include chemistry, biology, physics, and math. Biochemistry and physiology are also helpful.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general. Applicants must have a combined verbal and quantitative GRE score of at least 1100.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Required.

*Personal Statement:* Required. One page summarizing past academic and research experience (if any) and motivation for pursuing a PhD in pharmacology.

#### **Nondegree Applicants**

Nondegree applicants must show adequate preparation to enroll in desired courses and must obtain the permission of the director of graduate studies.

#### **Master of Science Applicants**

The department does not admit students to a master's program. A student in the PhD program may be awarded a terminal master's degree if he or she decides not to complete the PhD, provided enough research has been accomplished to write and defend a thesis.

### **Degree Requirements**

#### **Master of Science**

**Minimum Semester Hours Required:** 32.

#### **Course Work**

At least 4 hours must be in 500-level courses in the department.

*Required Courses:* Pcol 425. Students must also register in Pcol 595 each semester.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

#### **Other Requirements**

All graduate students must participate in the teaching of laboratory and conference sessions for medical and dental students and may be called upon to assist in other aspects of the teaching and research activities of the department.

Students are expected to attend special seminars sponsored by the department.

#### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

At least 27 hours must be in didactic courses, and at least 6 hours must be in 500-level courses in the department.

*Required Courses:* Pcol 425 and 505. Students must also register in Pcol 595 each semester.

#### **Examinations**

*Preliminary Examination:* Required.

#### **Dissertation**

Required.

#### **Other Requirements**

All graduate students must participate in the teaching of laboratory and conference sessions for medical and dental students and may be called upon to assist in other aspects of the teaching and research activities of the department.

Students are expected to attend special seminars sponsored by the department.

#### **Interdepartmental Specialization in Neuroscience**

In addition to meeting the above requirements, students pursuing a specialization in neuroscience must take Neus 580, 582, and 583 and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least two other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary examination.

## Physiology and Biophysics

*Mailing Address: Department of Physiology and Biophysics (MC 901), 835 South Wolcott Avenue, Chicago, Illinois 60612-7342*

*Campus Location: E202 MSB*

*Curriculum Code: 7538*

*Admission Codes: 20FS1584MS (MS); 20FS1584PHD (PhD)*

*Telephone: (312) 996-7620*

*E-mail: msmjl@uic.edu*

*Head of the Department: R. John Solaro*

*Director of Graduate Studies: Dale B. Hales*

The Department of Physiology and Biophysics offers work leading to a doctoral degree and participates in the MD/PhD dual degree program. An interdepartmental specialization in neuroscience is available. The department is oriented toward the study of mammalian physiology.

### Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* No restrictions. Prior academic work should include college mathematics through calculus, physics, biology, organic chemistry, and physical chemistry.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 32.

#### Course Work

*Required Courses:* PhyB 401, 402, 569, 592, 595, and 598 and BChe 460. Students must also register for PhyB 591 each fall and spring semester that they are enrolled in the graduate program.

#### Comprehensive Examination

Required.

#### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

#### Other Requirements

All graduate students must participate in the teaching programs of the department.

#### Doctor of Philosophy

*Minimum Semester Hours Required:* 96 from the baccalaureate.

#### Course Work

*Required Courses:* PhyB 401, 402, 569, 592, 595, and 599; BChe 460. Students must also register for PhyB 591 each fall and spring semester that they are enrolled in the graduate program.

#### Examinations

*Preliminary Examination:* Required; written and oral.

#### Dissertation

Required.

#### Other Requirements

All graduate students must participate in the teaching programs of the department. Candidates must present a midthesis seminar as a scheduled departmental seminar.

## Interdepartmental Specialization in Neuroscience

In addition to meeting the above requirements, students pursuing a specialization in neuroscience must take Neus 580, 582, and 583 and at least 8 additional hours of approved neuroscience courses other than research and independent study. Of these 8 hours, at least 5 must be outside of the student's major department and must be divided among at least 2 other departments. They must submit the topic of their dissertation to the Curriculum Subcommittee of the Committee on Neuroscience for approval no later than the time of the preliminary examination.

## Surgery

*Mailing Address: Department of Surgery (MC 958), 840 South Wood Street, Chicago, Illinois 60612-7322*

*Campus Location: 518 CSB*

*Curriculum Code: 9039*

*Admission Code: 20FS1721MS*

*Telephone: (312) 996-6765*

*E-mail: crastell@uic.edu*

*Head of the Department: Herand Abcarian*

*Director of Graduate Studies: Cristiana Rastellini*

The Department of Surgery offers work leading to the Master of Science in surgery. The aim of the program is to introduce the surgeon-in-training to the methods of scientific research in preparation for a career as a research physician. While pursuing a specific research project in depth, the student is expected to maintain contact with clinical science as a participant in the activities of the Department of Surgery.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Prior Degrees:* Applicants must have an MD or equivalent medical degree.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general. Recent graduates may substitute the MCAT.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Contact the director of graduate studies for information.

*Personal Statement:* Contact the director of graduate studies for information.

*Other Requirements:* Applicants must be enrolled in or have completed an approved residency program.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 32.

#### Course Work

At least 9 hours must be at the 500 level. Students must take at least three graduate-level courses other than Surg 597 or 598, including a course in statistical methods.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Thesis or project required. No other options available.

## Nursing Science

*Mailing Address: College of Nursing (MC 802), 845 South Damen Avenue, Chicago, Illinois 60612-7350*

*Campus Location: 138 NURS*

*Curriculum Codes: 1034 (Med/Surg); 1134 (Psychiatric); 1234 (Public Health); 1334 (Maternal-Child); 1534 (Administration); 1734 (Baccalaureate to Doctoral); 9034 (PhD)*

*Admission Codes: 20FS1502MS (Med/Surg); 20FS1503MS (Psychiatric); 20FS1504MS (Public Health); 20FS1501MS (Maternal-Child); 20FS1500MS (Administration); 20FS1497MS (Baccalaureate to Doctoral); 20FS1499PHD (PhD)*

*Telephone: (312) 996-3566 or 996-2184*

*E-mail: kdiana@uic.edu or ckenner@uic.edu*

*Dean of the College: Joan Shaver*

*Director of Graduate Studies: Carole Kenner*

The College of Nursing offers work leading to the Master of Science and Doctor of Philosophy degrees in nursing. Specializations are available in administrative studies in nursing; maternal-child nursing; medical-surgical; mental health; and public health nursing. An interdepartmental concentration in gender and women's studies is available to doctoral students. In addition, the college participates with the Graduate Professional Business Program in the MS (Nursing)/MBA joint degree program and with the School of Public Health in the MS (Nursing)/MPH joint degree program and offers a Baccalaureate to Doctoral program. The College of Nursing is fully accredited by the Commission on Collegiate Nursing Education.

## Admission Requirements

Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

### Master of Science

*Baccalaureate Field:* Applicants must have a baccalaureate degree with an upper-division major in nursing from an NLNAC or CCNE accredited program or a baccalaureate degree in another field and have graduated from a nursing program preparing the student for registered professional nursing. For the student with a baccalaureate degree in a field other than nursing, the courses NuSc 210, 242, and 385 must be completed. Additional course work may be required in some specializations. Consult the College of Nursing's graduate manual.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general. Applicants to the MS/MBA joint degree program may substitute the GMAT.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required; the letters should describe the applicant's suitability for further study in professional nursing.

*Personal Statement:* Required; the statements should address the applicant's previous work and academic experience.

*Other Requirements:* Applicants must be licensed to practice as a professional nurse in at least one political jurisdiction. Applicants whose baccalaureate degree is in a nonnursing field have additional course requirements.

Applicants must be interviewed by a graduate faculty member in the program area selected.

## MS/MBA

Prospective students for the joint degree program must apply and be admitted to both programs. The requirements for admission to the MS program are listed above.

Additional requirements for the joint degree program are one course in computer programming (any higher level language) and mathematics through the level of calculus (covering integration and differentiation).

## MS/MPH

Prospective students must apply and be admitted to both programs. The requirements for admission to the MS program are listed above. The joint program is designed for baccalaureate-prepared registered nurses seeking advanced nursing and public health background and public health nursing positions. Consult the School of Public Health's Student Handbook for information on the admission requirements of the MPH program.

## Baccalaureate to Doctoral

*Baccalaureate Field:* Applicant must have a baccalaureate degree with an upper-division major in nursing from an NLNAC or CCNE accredited program.

*Grade Point Average:* At least 3.25 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* None if the applicant is a UIC/CON graduate with a GPA of 3.25 (A=4.00). GRE if applicant is a graduate from another program or UIC/CON graduate with a GPA between 3.00 and 3.24.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required. The letters should describe the applicant's suitability for further study in professional nursing, particularly for a research career.

*Personal Statement:* Required. The statement should address the applicant's experience with teaching, research, specific area of interest, and interest in a research career.

*Other Requirements:* Each applicant must be licensed to practice as a professional nurse in at least one political jurisdiction.

*Interview:* A graduate faculty member in the program must interview applicant.

*Note:* The courses selected from the MS program are those that will provide the best basis for a research career. The student will be granted an MS in nursing science after the completion of 32 credit hours. This will meet the requirements of the Illinois Department of Professional Regulation that anyone who teaches nursing in Illinois must have a master's degree in nursing. However, this master's will not prepare students to be an advanced practice nurse as defined by the Illinois Practice Act. Neither will it prepare the graduate to sit for a certification examination in a specialty. If a student decides or is recommended to stop at any time after the MS, the student will be counseled to take additional course work to prepare them for a nurse practitioner or clinical nurse specialist capacity. The student has the option of enrolling in a postmaster's certificate program.

## Doctor of Philosophy

*Prior Degrees:* A master's degree in nursing from an NLNAC or CCNE accredited program. Applicants who have a baccalaureate degree from an accredited nursing program but have a master's degree in a field other than nursing are also eligible for consideration for admission. Students enrolled in graduate study in nursing at UIC may continue their graduate study in the doctoral program after being approved by the Admissions and Academic Standards Committee of the College of Nursing.



*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required. The letters should describe the applicant's suitability for further study in professional nursing.

*Personal Statement:* Required. The statement should address the applicant's overall career goals, previous work, and academic experience.

*Other Requirements:* Applicants must be licensed to practice as a professional nurse in at least one political jurisdiction.

Applicants must be interviewed by a graduate faculty member in the program area selected.

Admission is conditional on the availability of a faculty expert in the student's research area.

### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

*Minimum Semester Hours Required:* Varies by specialization. Administrative studies, 36–37; family nurse practitioner, 51–53; geriatric clinical nurse specialist, 47–49; geriatric nurse practitioner, 50–52; maternal-child, nurse midwifery, 58–60; maternal-child, pediatric nurse practitioner, 49–51; maternal-child, pediatric and perinatal clinical specialists, 39–41; maternal-child, women's health care nurse practitioner, 56–58; medical-surgical, all clinical nurse specialists, 40–42; medical-surgical, all acute care nurse practitioners, 48–50; mental health, 43–45; public health, community, 37–39; occupational health and school nurse specialists, 40–42, occupational health and school nurse practitioners, 62–64.

#### **Course Work**

*Required Core Courses:* NuSc 525, 526, 527, 528, 529, and 597 or 598 are required for all specializations.

#### *Specialization Courses:*

Administrative Studies—NuAS 515, 516, 517, and 518; HPA 511; Mgmt 541; and Epid 400.

Geriatric Clinical Nurse Specialist—NuMS 550, 552, 553, and 555 and NuSc 525, 526, 527, 528, 529, 530, 531, 532, 533, 597, and 598.

Geriatric Nurse Practitioner—NuMS 550, 552, 554, 556 and 558 and NuSc 525, 526, 527, 528, 529, 530, 531, 532, 533, 597, and 598.

Maternal-Child Nursing (Nurse Midwifery)—NuSc 531, 532 and NuMC 507, 508, 515, 517, 518, 525, 526, 527, and 528.

Maternal-Child Nursing (Pediatric Clinical Nurse Specialist)—NuSc 530, 531, and 532 and NuMC 510, 515, 516, 520, and 521.

Maternal-Child Nursing (Pediatric Nurse Practitioner)—NuSc 530, 531, 532 and 533 and NuMC 510, 511, 512, 513, 514, and 515.

Maternal-Child Nursing (Perinatal Clinical Nurse Specialist)—NuSc 531 and 532 and NuMC 507, 508, 515, 516, 520, and 521.

Maternal-Child Nursing (Women's Health Care Nurse Practitioner)—NuSc 531, 532 and 533; NuMC 507, 508, 517, 518, 525, 526, and 527; and either NuWH 550 or 555.

Medical-Surgical Nursing (all Clinical Nurse Specialists)—NuSc 530, 531, 532, 533 and NuMs 530, 532, 533, and 535.

Medical-Surgical Nursing (all Acute Care Nurse Practitioners)—NuSc 530, 531, 532, 533 and NuMs 530, 532, 534, 536, and 538.

Mental Health Nursing—NuSc 531, 532, and 533. NuPs 400, 515, 516, 517, 518, 521, and 522.

Public Health (Community Nurse Specialist)—NuPH 515, 516, 517, 518; EOHS 400; and EPID 400.

Public Health (Family Nurse Practitioner)—NuSc 530, 531, and 532; NuPH 500, 515, 516, 524, 525 and 528; and EPID 400.

Public Health (Home Health Care Specialist)—NuPH 515, 516, 517, 518, and 526; EOHS 400; and EPID 400.

Public Health (Occupational Health Nurse Practitioner)—NuSc 530, 531, 532; NuPH 400, 500, 515, 516, 524, 525, 529; EOHS 421, 482, 551, and 558; and EPID 400.

Public Health (Occupational Health Nurse Specialist)—NuPH 400, 515, 516, 517, 518, and 529; EPID 400; and EOHS 421, 482, 551, and 558.

Public Health (School Nurse Specialist)—NuPH 402, 420, 515, 516, 517, and 518; EPID 400; and EOHS 400.

Public Health (School Nurse Practitioner)—NuSc 530, 531, and 532; NuPH 402, 420, 500, 515, 516, 517, 518, 524, and 525; EPID 400; and EOHS 400.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

*Thesis:* Students must earn 5 hours in NuSc 598.

*Project:* Students must earn 3 hours in NuSc 597.

#### **MS/MBA**

*Minimum Semester Hours Required:* 65–67.

#### **Course Work**

*Required Core Courses:* NuSc 526, 527, 528, 529, and 597 or 598.

*Specialization Courses:* NuAS 515, 516, 517, and 518; Actg 500; Econ 520; Epid 400; Fin 500; IDS 532; Mgmt 541; Mktg 500; and four additional 500-level courses (16 semester hours) taken from at least two departments within the College of Business Administration.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

*Thesis:* Students must earn 5 hours in NuSc 598.

*Project:* Students must earn 3 hours in NuSc 597.

#### **MS/MPH**

*Minimum Semester Hours Required:* 58–66.

#### **Course Work**

*Required Courses:* Bstt 400; CHSc 400, 432, 480, and 494; EOHS 400; Epid 400; HPA 401; IPHS 650; NuPH 515, 516, 517, and 518; and NuSc 526, 527, 528, and 529.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project required. No other options available.

*Thesis:* Students must earn 5 hours in NuSc 598.

*Project:* Students must earn 3 hours in NuSc 597.

#### **Other Requirements**

Students in the joint program will have two advisors, one from the public health nursing faculty in the College of Nursing and one from the community health sciences program in the School of Public Health. Students may withdraw from the joint program and transfer to one of the two degree programs.

**Baccalaureate to Doctoral**

**Minimum Semester Hours Required:** 96.

**Course Work**

*Required Core Courses:* NuSC 505, 506, 511, 515, 517, 525, 526, 527, 528, 585, and 590, and 6 semester hours of statistics.

*Electives:* Twenty-eight hours are required. Fourteen hours at the 400 didactic level and must include at least 3 semester hours (6 contact hours) of clinical experience. The remaining 14 hours must be in 400- and 500-level didactic courses with a focus on advanced nursing science.

**Research Project**

Required. Students must earn 3 hours in NuSC 597.

**Dissertation**

Required. Students must earn at least 24 hours in NuSC 599.

**Examinations**

*Preliminary Examination:* Required.

**Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

**Course Work**

*Required Courses:* NuSc 505, 506, 511, 515, 517, 585, and 590 and 6 hours of statistics.

*Electives:* At least 14 hours must be in 400- and 500-level didactic courses with a focus on advanced nursing science.

**Dissertation**

Required. Students must earn at least 24 hours in NuSc 599.

**Examinations**

*Preliminary Examination:* Required.

**Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

## Forensic Science

*Mailing Address: Forensic Science Program (MC 866), 833 South Wood Street, Chicago, Illinois 60612-7231*

*Campus Location: 412C Pharm*

*Curriculum Code: 8535*

*Admission Code: 20FS1274MS*

*Telephone: (312) 996-2250*

*E-mail: reg@uic.edu*

*Head of the Program and Director of Graduate Studies:*

*R. E. Gaensslen*

The master's program in forensic science is administered by the Department of Biopharmaceutical Sciences, in cooperation with the Department of Criminal Justice. The program encompasses a broad knowledge of the basic areas of forensic science laboratory disciplines (biology/biochemistry, chemistry and trace evidence analysis, drug identification and toxicology, and pattern evidence) with emphasis on the integration of analytical and interpretative skills. The role of forensic laboratory sciences in justice system processes is an integrating theme. There is an opportunity for some specialization through the strategic selection of electives.

## Admissions Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* BS in physical, biological, or pharmaceutical sciences (chemistry recommended). Minimum of one semester analytical chemistry and one semester physical chemistry. Instrumental analysis, biochemistry, and additional physical chemistry desirable.

*Grade Point Average:* At least 3.00 (A=4.00). Applications are strengthened by 3.25 overall, and 3.00 in core science and mathematics courses.

*Tests Required:* GRE general. Applications are strengthened by scores corresponding to 60th percentile or higher, and minimum TOEFL score of 600 (if applicable).

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 37.

### Course Work

*Required Courses:* BPS 480, 580, 581, 582, 583, and 584.

*Electives:* Nine to twelve semester hours that may be selected in the student's specialty area of interest, may include 2–4 hours of internship (BPS 592) or up to 12 hours of residency (BPS 590) for those interested and who are accepted by the host agencies.

### Comprehensive Examination

Required for students choosing to fulfill the research requirement with BPS 597.

### Thesis, Project, or Course-work-only Options

Thesis or project. No other options available.

*Thesis:* Thesis students must earn at least 6 hours in BPS 598.

*Project:* Project students must earn 3 hours in BPS 597. Those electing the project option must also take a comprehensive exam.

## Medicinal Chemistry

*Mailing Address: Department of Medicinal Chemistry and Pharmacognosy (MC 781), 833 South Wood Street, Chicago, Illinois 60612-7231*

*Campus Location: 539 Pharm*

*Curriculum Code: 1035*

*Admission Codes: 20FS1454MS (MS); 20FS1454PHD (PhD)*

*Telephone: (312) 996-7245*

*Fax: (312) 996-7107*

*E-mail: medchem@uic.edu, fitzloff@uic.edu*

*Internet: www.uic.edu/pharmacy/depts/pmch/*

*Head of the Department: John M. Pezzuto*

*Director of Graduate Studies: John F. Fitzloff*

The Department of Medicinal Chemistry and Pharmacognosy offers work leading to degrees in medicinal chemistry at both the master's and doctoral levels. Medicinal chemistry is focused on the discovery and development of biologically active agents with potential therapeutic application. The program offers five concentrations: analytical and chemical toxicology, biomedicinal chemistry, computational medicinal chemistry, structural biology, and synthetic medicinal chemistry. The department also offers a graduate program in pharmacognosy; consult the appropriate heading in this catalog for more information on that program.

## Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Pharmacy, chemistry, or the biological sciences. Prior academic work should include a year each of biology or biochemistry and organic chemistry.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester (90 quarter) hours of baccalaureate study.

*Tests Required:* GRE general. The GRE advanced chemistry or biology test is recommended.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

### Master of Science

*Minimum Semester Hours Required:* 32. At least 16 semester hours must be completed in didactic courses.

### Course Work

*Required Core Courses:* MdCh 561, four hours of MdCh 592, two hours of MdCh 595 (one hour literature seminar and one hour thesis seminar), Bche 460, plus a minimum of 6 additional hours of required concentration and elective courses.

Students must select one of five concentrations: analytical and chemical toxicology, biomedicinal chemistry, computational medicinal chemistry, structural biology, or synthetic medicinal chemistry.

*Required Concentration Courses:*

Analytical and Chemical Toxicology—MdCh 412, 562, and 571.

Biomedicinal Chemistry—MdCh 412.

Computational Medicinal Chemistry—MdCh 572.

Structural Biology—MdCh 564 and Bche 513.

Synthetic Medicinal Chemistry—MdCh 560, 562, 564, 571, and 573.

*Recommended Electives:*

Analytical and Chemical Toxicology—Elective courses selected in consultation with the student's advisor.

Suggested electives include MdCh 564, 572, and 594 and Pcol 505 and 508.

Biomedical Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 562; Bche 513, 561, and 563; and Mim 552.

Computational Medicinal Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 564, Bche 513, Bioe 407, Chem 542 and 558, Bstt 400, CS 559, and ECE 560.

Structural Biology—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 412, 562, 571, and 572 and Chem 553, 554 and 558.

Synthetic Medicinal Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 572 and Chem 532, 533, 535, 545, and 553.

#### **Comprehensive Examination**

Required. (Given following completion of the second semester of required coursework.)

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available. Must complete at least 5 semester hours in MdCh 598.

*Thesis:* Thesis and oral thesis defense required.

#### **Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

#### **Course Work**

*Required Core Courses:* MdCh 561, four hours of 592, two hours of MdCh 595, Bche 460, and a minimum of 11 additional hours of required concentration and elective courses.

Students must select one of five concentrations: analytical and chemical toxicology, biomedical chemistry, computational medicinal chemistry, structural biology, or synthetic medicinal chemistry.

#### *Required Concentration Courses:*

Analytical and Chemical Toxicology—MdCh 412, 562, and 571.

Biomedical Chemistry—MdCh 412.

Computational Medicinal Chemistry—MdCh 572.

Structural Biology—MdCh 564 and Bche 513.

Synthetic Medicinal Chemistry—MdCh 560, 562, 564, 571, and 573.

#### *Recommended Electives:*

Analytical and Chemical Toxicology—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 564, 572, and 594 and Pcol 505 and 508.

Biomedical Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 562; Bche 513, 561, and 563; and Mim 552.

Computational Medicinal Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 564; Bche 513; Bioe 407; Chem 542 and 558; Bstt 400; CS 559; and ECE 560.

Structural Biology—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 412, 562, 571, and 572 and Chem 553, 554, and 558.

Synthetic Medicinal Chemistry—Elective courses selected in consultation with the student's advisor. Suggested electives include MdCh 572 and Chem 532, 533, 535, 545, and 553.

#### **Examinations**

*Departmental Qualifying Examination:* Required. Passing this examination permits doctoral students to bypass the formal requirement of writing a master's thesis. Good academic standing required for eligibility to take the

examination. (Given following completion of the second semester of required course work).

*Preliminary Examination:* Required; oral.

#### **Dissertation**

Required; including oral defense.

#### **Other Requirements**

All candidates must assist in teaching one or more of the courses offered by the College of Pharmacy or the department. Minimum of seventy semester hours of MdCh 599.

#### **Fellowships**

In addition to university-wide competitive fellowships, the Medicinal Chemistry program offers annually an endowed, program-specific competitive fellowship, the Professor Ludwig Bauer Fellowship in Medicinal Chemistry.

#### **Pharmacognosy**

*Mailing Address:* Pharmacognosy Program (MC 877), 833 South Wood Street, Chicago, Illinois 60612-7231

*Campus Location:* 331 Pharm

*Curriculum Code:* 6035

*Admission Codes:* 20FS1563MS (MS); 20FS1563PHD (PhD)

*Telephone:* (312) 996-7253

*E-mail:* cordell@uic.edu

*Director of the Program:* Norman R. Farnsworth

*Director of Graduate Studies:* Geoffrey A. Cordell

The Department of Medicinal Chemistry and Pharmacognosy offers a program of study leading to degrees in pharmacognosy at both the master's and doctoral levels. Major research areas concern the isolation, structure elucidation, and bioassay of plant constituents having biological activity, as well as the mechanisms of drug action and the fundamental mechanisms of activity of potential drug targets.

The department also offers work leading to graduate degrees in medicinal chemistry; consult the appropriate chapter in this catalog for more information.

#### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Baccalaureate Field:* Pharmacy, chemistry, or the biological sciences. Prior academic work should include a year each of biology and organic chemistry.

*Grade Point Average:* At least 3.75 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

*Other Requirements:* PhD applicants strongly preferred.

#### **Degree Requirements**

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### **Master of Science**

**Minimum Semester Hours Required:** 32.

#### **Course Work**

At least 16 hours must be in didactic courses.

*Required Courses:* PmPg 480, 510, 511, and 595.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis required. No other options available.

#### **Other Requirements**

Candidates must assist in one or more of the courses offered by the college or the department.



## Doctor of Philosophy

**Minimum Semester Hours Required:** 96 from the baccalaureate.

### Course Work

At least 28 semester hours must be in didactic courses.

**Required Courses:** PmPg 480 and 510 and two hours of PmPg 595.

Students must select one of four specializations: natural products drug discovery, medical ethnobotany, biomedical and molecular toxicology, or pharmaceutical biotechnology.

#### *Specialization Courses:*

Natural Products Drug Discovery—PmPg 511, 515, 516, and 521.

Medical Ethnobotany—Epid 410 and PmPg 511, 517, 518, and 520.

Biomedical and Molecular Toxicology—Bche 460 and Pcol 430 and 508.

Pharmaceutical Biotechnology—Bche 460 and PmPg 522.

#### *Electives:*

Natural Products Drug Discovery—Minimum of 10 credits, selected in consultation with the student's advisor. Suggested electives are Bche 460, MdCh 562, and PmPg 569.

Medical Ethnobotany—Minimum of 4 credits, selected in consultation with the student's advisor. Suggested electives are Anth 415 and 594, BioS 539 and 594, CHSc 450 and 554, and PmPg 569.

Biomedical and Molecular Toxicology—Minimum of 11 credits, selected in consultation with the student's advisor. Suggested electives are Bche 561; BioS 524 and 525; MdCh 561, 562, 565, 571 and 594; NuSc 525; and PmPd 561 and 562.

Pharmaceutical Biotechnology—Minimum of 12 credits, selected in consultation with the student's advisor. Suggested electives are Bche 513, 561 and 562; BioS 524 and 525; Gene 513 and 514; MdCh 412, 562, and 564; MIm 451 and 552; and PhyB 532, 533, and 585.

#### *Examinations*

*Departmental Qualifying Examination:* Required; written.

*Preliminary Examination:* Required; written and oral.

### Dissertation

Required.

### Other Requirements

Candidates must assist in one or more of the courses offered by the college or the department.

## Pharmacy

**Mailing Address:** College of Pharmacy (MC 871), 833 South Wood Street, Chicago, Illinois 60612-7231

**Campus Location:** 310 Pharm

**Curriculum Codes:** 7035AD (Administration); 7035PC (Pharmaceutics); 7035PD (Pharmacodynamics)

**Admission Codes:** 20FS1568MS (Administration MS); 20FS1568PHD (Administration PhD); 20FS1569MS (Pharmaceutics MS); 20FS1569PHD (Pharmaceutics PhD); 20FS1570MS (Pharmacodynamics MS); 20FS1570PHD (Pharmacodynamics PhD)

**Telephone:** (312) 996-0888

**E-mail:** hayat@uic.edu or crawford@uic.edu

**Director of Graduate Studies:** Win L. Chiou

**Program Coordinators:** Hayat Alkan-Onyuksel (Pharmaceutics and Pharmacodynamics); Stephanie Crawford (Pharmacy Administration)

The College of Pharmacy offers work leading to degrees in pharmacy at both the master's and doctoral levels. Course work and research are available in the general areas of pharmaceutics, pharmacodynamics, and pharmacy administration.

### Admission Requirements

Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College

minimum requirements, applicants must meet the following program requirements:

**Prior Degrees:** Baccalaureate or doctorate in pharmacy or a related field.

**Grade Point Average:** At least 3.00 (A=4.00) in work for the first academic degree.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 600 (paper-based); 250 (computer-based).

**Letters of Recommendation:** Three required from individuals who are familiar with the applicant's training, ability, character, and potential for successful completion of the program.

**Personal Statement:** Required; one page. The statement should address the applicant's educational and professional objectives.

**Other Requirements:** The Department of Pharmaceutics and Pharmacodynamics does not admit applicants who are seeking a master's degree only.

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

**Minimum Semester Hours Required:** Pharmacy administration, 42; pharmaceutics, 39; pharmacodynamics, 39.

#### Course Work

##### *Required Core Courses:*

Pharmacy Administration—Mgmt 541; HPA 463; Soc 500; EPsy 503; and PmAd 507, 510, and 595.

Pharmaceutics—BPS 495 and 520, Bstt 400, Chem 421, GC 401, plus 4 hours of seminar. A minimum of 10 hours must be in pharmaceutics courses, exclusive of research and seminar hours.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Thesis required. No other options available.

**Thesis:** Pharmacy administration students must earn 6 hours in PmAd 598; pharmaceutics students must earn at least 10 hours in BPS 598; pharmacodynamics students must earn at least 5 hours in BPS 598.

## Doctor of Philosophy

**Minimum Semester Hours Required:** 96 from the baccalaureate, 64 from the master's.

### Course Work

At least 20 hours must be in 500-level didactic courses.

#### *Required Core Courses:*

Pharmacy Administration—HPA 463; PmAd 482, 500, 507, 510, 516, 525, 535, 571, 595, and one PmAd elective; Psch 443, 543, and 545; and Soc 500.

Pharmaceutics—BPS 495 and 520; Bstt 400; Chem 421; GC 401; plus 8 hours of seminar and 10 hours of a research elective. A minimum of 12 hours must be in pharmaceutics courses, exclusive of research and seminar hours.

Pharmacodynamics—Bche 460; GC 470 and 471; BPS 420, 421, 500, 501, and 542; Bstt 500; Phar 400; and PhyB 401 and 402.

#### Examinations

*Departmental Qualifying Examination:* Required for pharmacy administration students only.

*Preliminary Examination:* Required.

### Dissertation

Required.

### Other Requirements

Students must demonstrate satisfactory proficiency in written and verbal communications and in the use of computer technology, according to the specifications developed for their area.

# School of Public Health

## Public Health Sciences

*Mailing Address: School of Public Health (MC 922), 1603 West Taylor Street (SPHPI), Chicago, Illinois 60612-7260*

*Campus Location: 1149 SPHPI*

*Curriculum Codes: 5037BI (Biostatistics); 5037CH (Community Health Sciences); 5037EO (Environmental and Occupational Health Sciences); 5037EP (Epidemiology); 5037HP (Health Policy and Administration)*

*Admission Codes: 20FS1634MS (Biostatistics MS); 20FS1634PHD (Biostatistics PhD); 20FS1635MS (Community Health Sciences MS); 20FS1635PHD (Community Health Sciences PhD); 20FS1636MS (Environmental and Occupational Health Sciences MS); 20FS1636PHD (Environmental and Occupational Health Sciences PhD); 20FS1637MS (Epidemiology MS); 20FS1637PHD (Epidemiology PhD); 20FS1638MS (Health Policy and Administration MS); 20FS1638PHD (Health Policy and Administration PhD)*

*Telephone: (312) 996-6620*

*E-mail: SEFurner@uic.edu*

*Dean of the School: Susan Scrimshaw*

*Director of Graduate Studies: Sylvia Furner*

The School of Public Health offers work leading to the Master of Science and Doctor of Philosophy degrees in public health, and participates with the College of Nursing in offering the MS (Nursing)/MPH joint degree program. An interdepartmental concentration in gender and women's studies is available to master's and doctoral students majoring in the area of community health sciences. Course work and independent research opportunities leading to master's and doctorate degrees are offered in the following areas: biostatistics, epidemiology, health policy and administration, community health sciences, and environmental and occupational health sciences.

The School of Public Health also offers programs leading to the Master of Public Health and Doctor of Public Health degrees and participates with other academic units in offering the MBA/MPH, MD/MPH, and DDS/MPH joint degree programs. These professional degree programs are not part of the Graduate College; consult the School of Public Health's catalog for more information.

### Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### Master of Science and Doctor of Philosophy

*Baccalaureate Field:* A major in the biological, physical, or social sciences is preferred.

*Grade Point Average:* At least 3.00 (A=4.00).

*Tests Required:* GRE general. The combined verbal and quantitative scores must be at least 1000.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement should address the applicant's intended research and career goals and reason for pursuing the MS or PhD degree in the chosen area.

*Other Requirements:* Generally, applicants to the PhD program must have a master's degree. Applicants may submit their master's thesis as evidence of their ability to plan and complete significant health-related research.

## MPH/MS Nursing

To be admitted to the joint program, applicants must meet the admissions criteria of both programs and be admitted to each through separate applications. Consult the chapter on Nursing for information on the admission requirements of the MS nursing program. Consult the School of Public Health's catalog for information on the admission requirements of the MPH program. Joint degree students must take their MPH training in community health sciences (CHS).

### Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

#### Master of Science

*Minimum Semester Hours Required:* 48.

##### Course Work

At least 32 semester hours must be in courses other than IPHS 598, and at least 9 semester hours must be at the 500 level. No more than 4 hours of IPHS 596 may be applied to the degree.

*Required Courses:* Epid 400 and Bstt 400.

*Electives:* The specific distribution of courses will vary according to the student's area of interest. Contact the School of Public Health for the specific requirements of each area.

##### Comprehensive Examination

Required only for biostatistics students.

##### Thesis, Project, or Course-work-only Options

Thesis or course work only. No other options available.

*Thesis:* Thesis required for all areas except biostatistics.

Thesis students must earn at least 16 hours in IPHS 598.

*Course work only:* Only for biostatistics students.

Comprehensive examination required.

##### Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

## MPH/MS Nursing

*Minimum Semester Hours Required:* 58 to 66.

##### Course Work

*Required Courses:* Bstt 400; CHSc 400, 432, 480, and 494; EOHS 400; Epid 400; HPA 401; IPHS 650; NuPH 515, 516, 517, and 518; and NuSc 526, 527, 528, and 529.

##### Comprehensive Examination

None.

##### Thesis, Project, or Course-work-only Options

Thesis or project required. No other options available.

*Thesis:* Students must earn 5 hours in NuSc 598.

*Project:* Students must earn 3 hours in NuSc 597.

**Other Requirements**

Students in the joint program will have two advisors, one from the public health nursing faculty in the College of Nursing and one from the community health sciences program in the School of Public Health. Students may withdraw from the joint program and transfer to one of the two degree programs.

**Doctor of Philosophy**

**Minimum Semester Hours Required:** 96 from the baccalaureate.

**Course Work**

At least 9 hours must be in 500-level didactic courses in the student's major area. If a collateral area is required by the major, at least 6 hours must be in the collateral area. No more than 40 semester hours of seminars and courses outside the major and collateral areas can be applied to the degree.

*Required Courses:* Epid 400 and Bstt 400 and 401.

**Dissertation**

Required. Students must register in IPHS 599 for at least 32 semester hours.

**Other Requirements**

Students must obtain supervised experience in classroom teaching in at least one course for at least part of a semester.

**Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.

# Jane Addams College of Social Work

## Social Work

*Mailing Address: Jane Addams College of Social Work  
(MC 309), 1040 West Harrison Street, Chicago, Illinois  
60607-7134*

*Campus Location: 4022 EPASW*

*Curriculum Code: 4726*

*Admission Code: 20FS0365PHD*

*Telephone: (312) 996-4629*

*E-mail: phd@jaddams.csw.uic.edu*

*Dean of the Jane Addams College of Social Work: Creasie  
Finney Hairston*

*Director of Graduate Studies: Mark Mattaini*

The Jane Addams College of Social Work offers work leading to the Doctor of Philosophy in social work. An interdepartmental concentration in gender and women's studies is available to doctoral students. The college also offers a program leading to the Master of Social Work degree; this professional degree program is not part of the Graduate College.

## Admission Requirements

Applicants are considered on an individual basis. Transcripts from all colleges attended must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

*Prior Degrees:* Master's degree required. Most applicants have a Master of Social Work degree; applicants with advanced training in other human service professions or in related social sciences are also eligible for consideration. Applicants must have satisfactorily passed a course in college-level statistics.

*Grade Point Average:* At least 3.00 (A=4.00) on the final 60 semester (90 quarter) hours of undergraduate study and for all work beyond the baccalaureate.

*Tests Required:* Graduate Record Examination (GRE).

*Minimum TOEFL Score:* 580 (paper-based); 237 (computer-based).

*Letters of Recommendation:* Four letters of recommendation required, ordinarily including former instructors and work supervisors. Contact the Jane Addams College of Social Work for more information.

*Personal Statement:* Required. Applicants must submit a statement of their interest in social work, their long range career goals and scholarly interests, and how those fit with the mission of the college.

*Other Requirements:* Applications must be submitted directly to the Jane Addams College of Social Work. Admissions are restricted to the fall semester.

## Deadlines

Application deadline is March 15, or the next working day after March 15. Early application is recommended.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

*Minimum Semester Hours Required:* 96 from the baccalaureate.

## Course Work

At least 9 semester hours must be earned at UIC in each of two consecutive terms. Students are expected to complete the residence requirement during the first or second year of their study. Students without a Master of Social Work may apply for admission if they have advanced training in other human service professions or in related social sciences. If offered admission, such students must complete all requirements for the Master of Social Work degree before beginning doctoral courses.

*Required Courses:* SocW 577, 590, 591, 592, 593, and 594.

*Electives:* At least 15 hours must be in courses outside of the Jane Addams College of Social Work. Six hours of the outside credit must be in an advanced statistics course supportive of the dissertation research. At least nine credits of outside course work should constitute a single substantive emphasis. At least 9 additional course work credits are required (either at the college or outside the college), at least 3 of which must be in advanced research methodology supporting the dissertation.

## Examinations

*Qualifying Examination:* Required.

*Preliminary Examination:* Required.

## Dissertation

Required.

## Interdepartmental Concentration in Gender and Women's Studies

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.



## Public Administration

*Mailing Address:* Public Administration Program (MC 278), 412 South Peoria Street, Chicago, Illinois 60607-7064  
*Campus Location:* 130 CUPPAH  
*Curriculum Code:* 5176  
*Admission Codes:* 20FS0339MPA (MPA); 20FS0339PHD (PhD)

*Telephone:* (312) 996-3109

*E-mail:* SameeraA@uic.edu

*Director of Graduate Studies:* George Beam

The graduate program in public administration is part of the College of Urban Planning and Public Affairs. The unit offers course work leading to the Master of Public Administration (MPA) and the Doctor of Philosophy in public administration.

MPA is a professional program fully accredited by the National Association of Schools of Public Affairs and Administration. Its broad goal is to train both preservice and working professionals for productive careers in the public service.

The doctoral program is designed to produce graduates with demonstrated analytic abilities and the creativity and potential for making significant, original contributions to the profession, whether as scholars, practitioners, or both. The program builds on a core of ideas and issues, with strong emphasis on theory construction and empirical research in the areas of organization theory and public management.

## Admission Requirements

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

### Master of Public Administration

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.25 (A=4.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE or GMAT is recommended, but not required.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required from instructors familiar with the applicant's academic training or supervisors familiar with the applicant's professional experience.

*Personal Statement:* Required. Applicants must submit a brief statement of their professional goals and academic interests.

### Doctor of Philosophy

Applicants are considered on an individual basis, taking into consideration superior academic performance and promise of future achievement. Those seeking admission to the program without a master's are encouraged to first complete the UIC Master of Public Administration Program.

*Prior Degrees:* Master's degree required. Applicants must present evidence of having completed a program of study similar in content and rigor to that offered through the MPA curriculum at UIC. Applicants whose graduate training is in areas other than public administration will have their credentials analyzed by a graduate admissions committee for possible deficiencies which may place them at a disadvantage with other students in the program. In cases of such deficiencies, students will be required to take additional course work as prescribed by the program director. Such course work will not apply to the degree requirements.

*Grade Point Average:* At least 3.00 (A=4.00) in all undergraduate course work and 3.25 in all postbaccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required from persons familiar with the applicant's academic achievements or professional experience.

*Personal Statement:* Required. Applicants must submit a brief statement of their professional goals and academic interests.

*Other Requirements:* Applicants must submit a writing sample and interview with one or more members of the faculty.

### Nondegree Applicants

Nondegree applicants must submit an official transcript from their baccalaureate institution and a letter stating which courses they would like to take and why they feel nondegree admission would be beneficial.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

### Master of Public Administration

*Minimum Semester Hours Required:* 54.

#### Course Work

*Required Courses:* PA 400, 405, 406, 410, 415, 490, 502, 503, and 504.

#### Comprehensive Examination

None.

#### Thesis, Project, or Course-work-only Options

Course work only. No other options available.

### Other Requirements

Full-time students participate in supervised internships with public service agencies; part-time students employed in public service conduct work-related projects.

### Doctor of Philosophy

*Minimum Semester Hours Required:* 96 from the baccalaureate. Students holding an MPA degree from UIC or an equivalent program will ordinarily receive a maximum of 32 semester hours toward the degree requirement. At least 16 semester hours must be taken in PA 599.

#### Course Work

A cumulative grade point average of at least 3.00 (A=4.00) in all graduate courses taken at UIC is required for graduation. Credit is not given for any required course in which a grade of less than B is earned.

*Required Courses:* PA 501, 505, 510, 540, and 541.

Students must also take four research seminars, selected in consultation with their advisor from among PA 515, 520, 525, 531, 535, 542, 543, and 594.

#### Preliminary Examination

Required. After the completion of all required and elective course work, the student will present three papers initially prepared in the chosen research seminars. The papers will be evaluated by the program director and the major advisor to ensure that the student's scholarship is sufficient to undertake the writing and eventual defense of a bibliographic essay. The bibliographic essay will be written under the supervision of a five-person preliminary examination committee whose chairman and members will be appointed by the dean of the Graduate College on the recommendation of the program director. The student will publicly defend the bibliographic essay before the

examination committee and the scholarly community. The satisfactory public defense of the bibliographic essay, as determined by the examination committee, will constitute satisfactory completion of the preliminary examination.

The bibliographic essay will be an exhaustive, interpretive analysis of a body of scholarly literature associated with a significant theoretical or empirical issue in public administration. It is expected that a satisfactory essay will normally require a length of at least 75 pages (typewritten, double-spaced). The preliminary examination committee will determine the scholarly sufficiency of the essay and its defense in all aspects, subject to the rules and procedures of the Graduate College. The purpose of the bibliographic essay and its required defense is to establish that the student has attained a sufficient degree of scholarly sophistication in the organization and analysis of a significant body of literature, in addition to having completed all required and elective course work. The student's sufficiency in this regard will be demonstrated by the ability to a) identify a significant theoretical or empirical issue and its associated body of literature; b) organize and interpret the strengths, weaknesses, and general intellectual robustness of that literature; and c) defend his or her observations and judgements with respect to both particular works and overall themes and assumptions of the chosen body of literature as a whole. A copy of the defended bibliographic essay will be deposited with the Office of the Graduate Program in Public Administration, and will be made available for inspection by faculty and students of the program.

#### **Dissertation**

Required. The dissertation will make a contribution to knowledge in public administration and will be publicly defended before the scholarly community and a committee appointed by the Dean of the Graduate College on the recommendation of the program director. At least 16 and no more than 28 semester hours may be awarded for dissertation research.

It is expected that no later than the end of the semester following the completion of the preliminary examination the student will submit a written statement of the dissertation plans to his/her major advisor. Upon the recommendation of the program director and approval of the dean of the Graduate College, a five-person dissertation committee will be appointed. The committee will include at least one member from outside the Public Administration Program.

The dissertation prospectus will contain an analysis of the relevant literature, the theoretical issues to be pursued, the data to be used and the methods of analysis, and a statement of the anticipated significance of the research project. The prospectus will be defended before the committee. Until the prospectus is approved, the student will not be authorized to proceed with dissertation research. The final version of the dissertation will incorporate any changes recommended by the committee.

#### **Other Requirements**

All doctoral candidates must participate in a teaching activity. The timing, length, and nature of this activity will be determined on a case-by-case basis by the student's major advisor and the program director.

## **Urban Planning and Policy**

*Mailing Address: Urban Planning and Policy Program (MC 348), 412 South Peoria Street, Chicago, Illinois 60607-7137*

*Campus Location: 215 ALHS*

*Curriculum Codes: 2276 (MUPP), 2876 (PhD)*

*Admission Codes: 20FS1786MUPP (MUPP); 20FS1785PHD (PhD)*

*Telephone: (312) 996-5240*

*E-mail: upp@uic.edu*

*Director of Graduate Studies: Charles Hoch*

The College of Urban Planning and Public Affairs offers programs of professional study leading to the Master of Urban Planning and Policy (MUPP) degree and to the Doctor of Philosophy (PhD). The MUPP program is accredited by the Planning Accreditation Board of the American Institute of Certified Planners and the Association of Collegiate Schools of Planning. Students in the MUPP program generally choose one or two of five substantive specializations: community development, economic development, international development, physical planning, or urban transportation. Students with special interests or career goals may, with faculty approval, pursue a program area of their own design, such as health planning.

### **Admission Requirements**

Applicants are considered on an individual basis. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

#### **Master of Urban Planning and Policy**

*Baccalaureate Field:* No restrictions.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None required for admission. Applicants for university fellowships must submit GRE general scores. Applicants with undergraduate degrees from universities outside the U.S. are strongly urged to submit GRE general scores.

*Minimum TOEFL Score:* 550 (paper-based); 213 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement must address the applicant's educational and career goals and previous pertinent work, volunteer, and/or academic experience.

*Other Requirements:* Applicants must submit a recent paper, essay, or project of which they are the sole author or designer. This material may be of an academic, professional, or personal nature, and must be at least 1,000 words in length.

Applicants for research assistantship positions are encouraged to submit a resume.

## **Doctor of Philosophy**

*Prior Degrees:* Applicants must have a master's degree.

*Grade Point Average:* At least 3.00 (A=4.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general. Applicants may substitute the GMAT or LSAT.

*Minimum TOEFL Score:* 600 (paper-based); 250 (computer-based).

*Letters of Recommendation:* Three required.

*Personal Statement:* Required. The statement must address the applicant's educational and career goals and previous pertinent work, volunteer, and/or academic experience.

*Other Requirements:* Applicants must submit a recent paper, essay, or project of which they are the sole author or designer. This material may be of an academic, professional, or personal nature, and must be at least 1,000 words in length.

Applicants for research assistantship positions are encouraged to submit a resume.

### **Deadlines**

The application deadline for this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

## **Degree Requirements**

### **Master of Urban Planning and Policy**

*Minimum Semester Hours Required:* 60.

#### **Course Work**

At least 24 hours must be at the 500 level, and at least 12 hours must be at the 500 level in the student's major area.

*Required Courses:* UPP 500, 501, 502, 503, and 504.

*Specialization Courses:* Students must complete at least one three-course specialization in a substantive field of planning. Students may select from the following approved specializations or develop their own with faculty approval.

Community Development—UPP 540, UPP 541, and another 540 series or faculty approved course.

Economic Development—UPP 530, UPP 531, and another 530 series or faculty approved course.

International Development—UPP 520, UPP 521, and another 520 series or faculty approved course.

Physical Planning—UPP 550, UPP 551, and UPP 552.

Urban Transportation—UPP 560, UPP 561, and UPP 562.

*Methods Courses:* Students must take at least two methods courses, beyond those in the core, approved by their advisor. These may include methods courses taken to meet specialization requirements.

#### **Comprehensive Examination**

None.

#### **Thesis, Project, or Course-work-only Options**

Thesis or project. No other options available.

*Thesis:* No more than 16 hours of UPP 598 can be applied to the degree.

*Project:* No more than 4 hours of UPP 597 can be applied to the degree.

#### **Other Requirements**

*Continuous Registration:* Students who have completed all degree requirements except the thesis/project must register for zero credit hours to maintain continuous registration.

*Internship:* Students must complete UPP 591 Professional Practice Experience. This course includes an in-class seminar plus 300 hours of internship.

### **Doctor of Philosophy in Public Policy Analysis**

*Minimum Semester Hours Required:* 96 from the baccalaureate, 72 from the master's.

#### **Course Work**

*Required Courses:* PPA 500, 540, 541, and 590 and UPP 513, 583, and 584.

*Specialization Courses:* At least 28 hours must be taken in the area of specialization, selected in consultation with a faculty committee. At least 8 hours in advanced research design and methods are required in the area of specialization.

#### **Examinations**

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required; written. An oral examination may also be required at the discretion of the committee.

#### **Dissertation**

Required.

#### **Other Requirements**

*Career Training:* Students must complete an internship in a public or private agency; a collaborative faculty/student research project; or classroom teaching under faculty supervision. No more than 12 hours of credit for career training can be applied to the degree.

#### **Interdepartmental Concentration in Gender and Women's Studies**

Students earning a graduate degree in this department may complement their courses by enrolling for a concentration in gender and women's studies after consulting with their graduate advisor. Students pursuing this concentration must apply to the director of the Gender and Women's Studies Program and obtain approval from a gender and women's studies graduate faculty member, preferably within the department of the degree, who becomes the student's gender and women's studies advisor. Students should enroll in a total of 16 hours of graduate course work, including GWS 501 and GWS 502, plus eight additional hours of gender and women's studies or cross-listed courses at the graduate level. Up to four of these hours can be directed study or thesis research on an appropriate topic approved by the student's gender and women's studies advisor.





## Graduate Courses

The course descriptions listed below were current at the time of printing. Up-to-date course descriptions can be found on the World Wide Web at <http://www.uic.edu/depts/grad/courses/>.

### Accounting (Actg)

**417. Advanced Financial Accounting. 4 Hours.** Financial accounting theory for business combinations, consolidated financial statements, international transactions and investments, and partnership accounting. Prerequisite: Actg 316.

**435. Auditing. 4 Hours.** Introduction to the audit function; ethical and legal environment; audit standards; objectives and procedures; materiality and audit risk; sampling; auditing in a computer environment; reporting. Extensive computer use required. Prerequisite: Actg 316.

**436. Advanced Auditing. 4 Hours.** Audit factors affecting the nature of evidential matter, performance of audit procedures, and the auditor's report; special problems in reporting; advanced development of basic concepts. Prerequisite: Actg 335.

**445. Federal Income Tax I. 3 Hours.** Concepts and provisions of federal income taxation as applicable to individual taxpayers, partnerships, individuals and trusts. Extensive computer use required. Prerequisite: Actg 315.

**446. Federal Income Tax II. 4 Hours.** Concepts and provisions of federal income taxation on corporations and partnerships; special problems in reorganization, liquidations, and personal holding companies. Prerequisites: Actg 345 or the equivalent, and declaration of a major.

**447. Taxation of Estates, Gifts and Trusts. 4 Hours.** Taxation of estates, gifts and trusts, with emphasis on estate planning for federal tax purposes. Prerequisites: Actg 345 and 446 or approval of the Department.

**448. Advanced Tax. 4 Hours.** Federal tax procedures with emphasis on dealing with IRS assessment and audit procedures. Prerequisite: Actg 345.

**449. Special Topics in Taxation. 4 Hours.** An in-depth analysis of special topics in federal taxation emphasizing corporations, passive loss rules and pension-retirement plans. Prerequisites: Actg 345 and 446; or approval of the department.

**456. Business Law II. 4 Hours.** Commercial law for partnerships, corporations, secured transactions, bankruptcy, real and personal property, wills and trusts, SEC regulations, unfair trade activities. Prerequisites: Actg 355 or the equivalent, and declaration of a major.

**465. Governmental and Non-Profit Accounting. 4 Hours.** Financial transaction analysis and recording system; budget preparation and control; concepts and principles underlying the financial reports of governmental and non-profit organizations. Prerequisite: Actg 316.

**474. Accounting Information Systems. 4 Hours.** Concepts and principles of designing computer systems to perform accounting functions; applications of microcomputer accounting software packages. Prerequisites: Actg 111 and IDS 100.

**475. Database Accounting Systems. 4 Hours.** Same as IDS 475. Concepts and principles of designing database systems to perform accounting functions, applications of microcomputer accounting software packages systems design tools, and computerized transaction cycles. Extensive computer use required. Prerequisites: Actg 111 and IDS 100.

**484. International Accounting. 4 Hours.** Financial accounting for international operations, multinational managerial accounting and control, comparative international accounting, international reporting issues, and international taxation. Prerequisite: Actg 316.

**485. Valuation and Analysis. 4 Hours.** Financial analysis and valuation of firms. Corporate strategies, financial reporting issues and market perceptions. Extensive computer use required. Prerequisites: One accounting and one finance class or consent of the instructor.

**494. Special Topics in Accounting. 1 to 4 Hours.** Topics rotate in various areas of accounting, including but not restricted to financial, managerial, governmental and nonprofit accounting, law and business ethics. Explores current issues and proposed alternatives. Prerequisites: Two courses in accounting or finance beyond Actg 111 and Fin 300 or the equivalent.

**495. Competitive Strategy. 4 Hours.** Multidisciplinary analysis of organization strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

**500. Introduction to Financial Accounting. 4 Hours.** No credit given if the student has credit in MBA 501. Concepts and principles of financial accounting for preparation and evaluation of external reports and financial statements. Extensive computer use required. Prerequisite: Admission to the MBA or M.S in Accounting program.

**502. Financial Accounting I. 4 Hours.** Accounting theory and practice related to asset valuation, revenue recognition, and the determination of short-term liabilities; aspects of financial statement analysis related to these issues. Prerequisite: Actg 500.

**503. Financial Accounting II. 4 Hours.** Contemporary financial accounting issues, including liabilities, pensions, tax allocation, leases, price level reporting, investments, capital transactions and financial statement analysis. Prerequisites: Actg 500 and 502, or the equivalents.

**506. Management Accounting. 4 Hours.** Design of cost accounting systems; alternate costing methods; costing for decision making; budget planning and performance evaluation. Prerequisite: Actg 500.

**508. Federal Income Tax-Graduate. 4 Hours.** Concepts and provisions of federal income taxation as applicable to individual taxpayers. Prerequisite: Actg 500.

**509. Business Law-Graduate. 4 Hours.** Commercial law of contracts, sales, commercial paper, agency, suretyship, insurance law and liability of management. Prerequisite: Actg 500 or the equivalent.

**515. Accounting Theory and Paradigms. 4 Hours.** Conventional and regulatory approaches to standard setting and theory construction, conceptual framework and paradigmatic avenues in accounting. Prerequisite: Actg 503 or the equivalent.

**516. Financial Statement Analysis. 4 Hours.** Use of financial information by decision makers external to the firm; profitability and risk analysis; financial forecasting and equity valuation. Extensive computer use required. Prerequisite: Actg 502; or approval of the department.

**517. Financial Accounting Research. 4 Hours.** Applies economic, finance theory, quantitative methods to study supply and demand for accounting information, to investors' assessments of accounting information and statistical analysis of accounting information. Prerequisites: Actg 516 or the equivalent, and admission to the PhD in Business Administration program.

**525. Management Control of Strategic Performance. 4 Hours.** Contemporary overview of the management control systems measuring technological activities, measuring value added, outsourcing non-core compensation plan and performance measurement. Extensive computer use required. Prerequisite: Actg 506; or approval of the department.

**527. Managerial Accounting Research. 4 Hours.** Contemporary topics in management accounting research. Includes agency theory and incentive contracts, behavioral research applications, and analytical managerial models. Prerequisites: Actg 525 or the equivalent, and admission to the PhD in Business Administration program.

**535. Auditing Theory. 4 Hours.** Philosophy of science and ethics, research methods, experimental economics, and capital market research. Special topics in current auditing issues addressed through the case method. Prerequisite: Actg 335.

**545. Taxes and Business Policy. 4 Hours.** The role of taxes in business decisions. Emphasizes integrating taxes with other variables-behavioral, financial, environmental and other. Also discusses the relationship between taxation and financial and managerial accounting. Prerequisites: Actg 345 and 446.

**564. Fundamentals of Governmental and Non-Profit Accounting. 4 Hours.** Financial transaction analysis and recording system; budget preparation and control; concepts and principles underlying the financial reports of governmental and nonprofit organizations.

**585. Corporate Valuation and Accounting Information. 4 Hours.** Valuation using discounted cash flow and multiples. Use of financial disclosures to construct forecasts. How multiples behave. How accounting affects valuation ratios. Prerequisites: Actg 502 and Fin 500; or approval of the department.

**591. Accounting Policy and Practice. 4 Hours.** Institutions and processes of setting accounting and auditing standards; managerial responses to and incentives for adopting standards; professional practice and public policy issues. Prerequisites: Actg 515 and 525.

**592. Accounting Policy Research. 4 Hours.** Objectives of accounting policies; policy formation processes and incentives for adoption; evaluating policies in terms of economic and political consequences; methods of accounting policy research. Prerequisites: Actg 517 and 527.

**593. Accounting Research: Methodology and Communication. 4 Hours.** Instruction in research methods, issues, and research appreciation and evaluation together with individual practice in planning, conducting, and reporting professional research projects in accounting and capital markets. Extensive computer use required. Prerequisite: Actg 502.

**594. Special Topics in Accounting. 4 Hours.** Topics rotate in the various areas of accounting, including but not restricted to financial, managerial, governmental and nonprofit accounting, explores current issues and proposed alternatives. Prerequisite: Approval of the department.

**596. Independent Study in Accounting—Master's. 1 to 4 Hours.** Independent study on an accounting topic chosen with faculty approval; requires a study plan and a paper of length and specification required by a faculty member. Prerequisites: Actg 515 and 525.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on topic of the doctoral dissertation. Prerequisite: Faculty acceptance of thesis proposal.

## Administrative Studies in Nursing (NuAS)

**515. Advanced Nursing Management in Community-Focused Health Services. 3 Hours.** Same as NuPH 515. Theory and research in leadership, management, and community-focused assessment for advanced nursing practice in complex and integrated health systems. Prerequisite: NuSC 528 or consent of the instructor.

**516. Evaluation of Health Services Outcomes for Nursing. 3 Hours.** Same as NuPH 516. Program planning and evaluation in community-focused health services. Measurement of quality, performance, and impact on health programs and services. Interdisciplinary perspective. Integrated quality improvement systems. Prerequisite: NuAS 515 or consent of the instructor.

**517. Budget and Finance of Health and Nursing Services. 3 Hours.** Same as NuPH 517. Financial management techniques, supply and demand, cost behaviors, and revenue sources, provider reimbursement and public and private health insurance for health and nursing services will be analyzed. Prerequisite: NuAS 515 or consent of the instructor.

**518. Field Study in Health and Nursing Management. 3 Hours.** Same as NuPH 518. Field study emphasizing leadership within population-focused nursing management practice including organization and management concepts from public and private perspective. Prerequisites: NuAS 516 and 517, or consent of the instructor.

**550. Issues for Research and Practice in Women's Health. 3 Hours.** Same as NuSc 550 and NuWH 550. Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women's health care practice are developed as a basis for research. Prerequisite: Consent of the instructor.

## African-American Studies (AASt)

**410. Seminar in Black Child Development. 4 Hours.** Race, class, and cultural theories of black child development. Examination of socialization process and developmental outcomes, with particular attention to social attitudes and behaviors. Prerequisite: AASt 201 or Psch 100 or consent of instructor.

**441. Topics in African History. 4 Hours.** Same as Hist 441. May be repeated for credit. Specific topics are announced each term.

Prerequisite: 3 hours of African history, African-American studies, or consent of the instructor.

**445. History of Islam in the African World. 4 Hours.** Same as Hist 445. A comprehensive study of the history of Islam and its role among the people of African descent in sub-Saharan Africa and the United States. Prerequisite: Consent of the instructor.

**470. Reading Black Women Writing. 4 Hours.** Same as Engl 480 and WS 470. Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. Prerequisite: AASt 110 or 111 or 250 or consent of the instructor.

**472. Issues and Events in Twentieth-Century China. 4 Hours.** Same as Hist 472. Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history.

**481. Topics in African-American History. 4 Hours.** Same as Hist 485. May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. African-American history for students with significant background in the field. Topics vary. Prerequisite: AASt 247 or AASt 248 or Hist 104 or consent of instructor.

**490. Topics in African-American Literature. 4 Hours.** Same as Engl 473. May be repeated for credit. Students may register for more than one section per term. African-American literature and culture for students with significant background in the field. Topics vary. Prerequisite: AASt 110 or 111 or 250 or consent of the instructor.

**492. Topics in Social Science Research. 4 Hours.** May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. Inclusive examination of a selected specialized topic based on instructor's field. Topics are drawn from research in political science, psychology, sociology, and history. Prerequisite: AASt 100 or consent of instructor.

**496. Topics in Race, Ethnic, and Minority History. 4 Hours.** Same as Hist 496. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor

## Anatomy and Cell Biology (Anat)

**403. Human Neuroanatomy. 3 Hours.** Morphological organization of the nervous system. Functional correlations of neural structures. Prerequisite: Consent of the instructor.

**414. Neuroanatomy for Allied Health Program. 3 Hours.** Basic development and gross features of the central nervous system and systems neuroanatomy; motor, sensory and integrative functional areas.

**439. Gross Human Anatomy I. 5 Hours.** Functional and structural anatomy and embryology of the body. Prerequisite: Consent of the instructor.

**440. Gross Human Anatomy II. 2 Hours.** Gross morphology and function of the human body. Prerequisite: Anat 439 or consent of the instructor.

**441. Gross Human Anatomy. 5 Hours.** For allied health students. Functional and structural anatomy of the body. Prerequisites: Consent of the instructor; or enrollment in the MS in Biomedical Visualization program.

**442. Cell Structure and Human Histology. 5 Hours.** Structure and function of cells and fundamental tissues. Function and microscopic anatomy of organs. Prerequisite: Consent of the instructor.

**505. Quantitative Morphology. 2 Hours.** Same as Path 505. Principles and practice of morphometry and stereology, which are methods for quantitating structure. Specific application to the histological and ultrastructural levels of Anatomy and Pathology. Prerequisites: Path 425 and 504, or Anat 442, or consent of the instructor.

**514. The Cytoskeleton: Cellular and Molecular Biology. 1 Hour.** Structure and function of microfilaments, microtubules, intermediate filaments, and their associated proteins. Role of the cytoskeleton in various cellular processes such as cell motility and organelle transport. Role of the cytoskeleton in diseases.

**520. Concepts of Synaptic Function and Morphology. 2 Hours.** Overview of current and classical methods employed in the study of synapses. A review of some of the most interesting aspects of synaptic function, such as sources of synaptic vesicles, synaptic patterns,

synaptic plasticity, and synaptic specificity. Prerequisite: Consent of the instructor.

**521. Plasticity in the Nervous System. 2 Hours.** Neural plasticity is the ability to adaptively modify neural structure or function. Topics range from developmental plasticity to aging, including response to injury and neurodegenerative diseases, trophic factors, learning and memory, and neural transplantation. Prerequisite: Anat 403 or consent of the instructor.

**526. Advanced Topics in Neuroanatomy. 2 Hours.** Selected topics in neuroanatomy are reviewed and updated in terms of changing research methodology and newly emerging concepts in neurobiology.

**527. Cellular and Systems Neurobiology. 3 Hours.** Same as BioS 527. Molecular and cellular properties of ion channels in neurons and sensory cells and their relationship to brain and sensory systems. Prerequisite: Credit in one neuroscience course or consent of the instructor.

**528. Chemical and Molecular Neuroanatomy. 3 Hours.** Substantive reviews on topics in molecular neurobiology are presented. Each lecture focuses on the application of data and techniques to the understanding of neural function within intact neuroanatomical systems. Prerequisite: Anat 403 or consent of the instructor.

**544. Advanced Craniofacial Anatomy. 3 Hours.** Functional and clinical aspects of head and neck anatomy, based on detailed laboratory dissection, original readings, and project work. Prerequisite: Any human gross anatomy course or the equivalent.

**554. Neuroendocrinology. 2 Hours.** Survey of neuroendocrine integration including neuroendocrine regulation of development, homeostasis, reproduction, and behavior. The hypothalamohypophyseal axis receives special attention from both morphologic and functional viewpoints. Prerequisite: Anat 403 or the equivalent.

**555. Sensory Motor Systems. 2 Hours.** Introductory and in-depth review of the current original literature covering ensembles of movement generated by CNS intrinsic and/or externally acquired sensory signals. Prerequisite: Anat 403 and PhyB 402 or the equivalent courses, or consent of the instructor.

**560. Practicum in the Teaching of Anatomy. 1 to 3 Hours.** No graduation credit. Satisfactory/Unsatisfactory grade only. May be repeated for credit. For anatomy and cell biology teaching assistants. Provides an opportunity for supervised discussion and evaluation of materials and methods in teaching the basic anatomical sciences. Prerequisite: consent of the instructor.

**585. Cell Biology. 4 Hours.** Same as PhyB 585 and MIm 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

**586. Cell and Molecular Neurobiology. 3 Hours.** Same as Bios 586. Structure and function of voltage-dependent and neurotransmitter-gated ion channels; the role of these ion channels in synaptic transmission, synaptic modification, and neuromodulation. Prerequisite: Bios 442 or consent of the instructor.

**595. Department Seminar. 1 Hour.** S/U grade only. Oral presentations are made by students each session on timely journal articles, followed by in depth discussions of the reported research. Presentation of research by invited lecturers.

**596. Independent Study. 1 to 4 Hours.** Independent study under the direction of a faculty member.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. Thesis research under the direction of a faculty member.

**599. Research in Anatomy. 0 to 16 Hours.** S/U grade only. Independent research, directed by a faculty member.

## Ancient Greek (GkA)

**498. Advanced Topics in Ancient Greek Literature. 4 Hours.** May be repeated for a maximum of 9 hours of credit. Students may register for more than one section per term. Intensive reading of ancient Greek literature. Topics vary. Prerequisite: 4 hours of ancient Greek at the 200 level or the equivalent.

**499. Independent Reading. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Individual study under faculty direction. For students qualified by preparation and interest. Prerequisite: 4 hours of ancient Greek at the 200 level or the equivalent.

## Anthropology (Anth)

**405. Human Growth and Nutrition. 3 Hours.** Same as Epid 405. Worldwide variation in human growth and the factors that contribute to differences between populations and individuals in the timing and pattern of growth and development.

**410. Peasants. 4 Hours.** Comparative study of peasant societies in diverse regions of the world; critical review of the literature and case studies. Prerequisite: Anth 213 or consent of the instructor.

**411. Urban Cultural Problems. 4 Hours.** A study of the processes of urbanization and of cultural and social adjustments to the city; illustrated by case studies.

**412. Literature and Anthropology. 4 Hours.** The dialogue between anthropology and creative writing as seen in portraying "the native" and his culture in novel, science fiction, and the traveller's tale.

**413. Social Organization. 4 Hours.** Theory and method in the study of kinship and social organization, for advanced undergraduate and graduate students. Prerequisite: Anth 213 or graduate standing or consent of the instructor.

**414. Symbolic Anthropology. 4 Hours.** The interpretation of cultures through their ritual, religions, culture and other types of symbolism. Prerequisite: Anth 101 or consent of the instructor.

**415. Medical Anthropology. 4 Hours.** Survey of the history of non-Western medicine; analysis of ecological relationships behind folk medicine; principles and methods of studying ethnomedicine. Prerequisite: Anth 200 or consent of the instructor.

**416. Economic Life of Primitive Peoples. 4 Hours.** Patterns of production, distribution and consumption in non-Western culture. A study of cultural variation in attitude toward labor; concepts of prestige, property, and wealth.

**417. Marxist Approaches to Anthropology. 4 Hours.** Issues concerning Marx's theories on primitive societies, the development of his evolutionary model from Morgan's work, and current use of Marxist concepts in anthropology.

**418. Fieldwork: Ethnographic and Qualitative Fieldwork Techniques. 4 Hours.** Same as Soc 408. Practical introduction to the techniques of anthropologists and qualitative sociologists for research in natural social settings: participant observation/nonparticipant observation, interviewing, use of documentary sources. Prerequisite: Anth 213 or Soc 202 or consent of the instructor.

**419. Aging, Culture, and Society. 4 Hours.** Examination of the ways in which the experience of aging and the social position of elderly persons vary according to cultural context and the social system of which they are a part. Prerequisite: 3 hours of a social science or consent of the instructor.

**420. Seminar in Archaeology and Ethnography. 4 Hours.** May be repeated for a maximum of 15 hours of credit. Case studies of investigations in archeology using research monographs and other primary sources. Substantive data and related theoretical problems are examined simultaneously.

**421. Geomorphology and Archaeology. 4 Hours.** Same as Geog 432. Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geoarchaeology. Prerequisite: Geog 131 or EaEs 101 or consent of the instructor.

**422. Prehistory of the Levant and the Nile Valley. 4 Hours.** Detailed analysis of Levantine and Nile Valley prehistory during the Pleistocene and early Holocene. Prerequisite: Anth 221 or 222 or consent of the instructor.

**423. Early Civilizations of the Old World. 4 Hours.** Early civilization and incipient urbanization in Eurasia and Africa.

**424. Violence. 4 Hours.** Same as Criminal Justice 423. Explores how men and women have experienced violence historically and in modern times. Students examine how violence is perpetrated through words, pictures, physical harm, and silences. Prerequisites: CrJ 101 and CrJ 200.

**425. Field Techniques in Archaeology. 4 Hours.** Exposure to field methods in archaeology through participation in an actual research project. Students are instructed in field excavation techniques. Usually offered in summer session. Prerequisites: Anth 102 or the equivalent and consent of the instructor. Concurrent registration in Anth 426 is recommended.



**426. Laboratory Techniques in Archaeology. 4 Hours.**

Exposes students to laboratory methods in archaeology through the analysis of excavated materials. Students are instructed in laboratory techniques including processing, classifying, dating, interpretation, evaluation, and preparation of written reports of archaeological research. Usually offered in the summer. Prerequisites: Anth 102 or the equivalent and consent of the instructor. Concurrent registration in Anth 425 is recommended.

**427. Theory and Application in Ethnoarchaeology. 4 Hours.**

Focuses on the application of scientific experimentation and ethnographic information to enhance our understanding of the archaeological record, material culture, and past human behavior. Prerequisite: consent of the instructor.

**430. Seminar in Primate Biology. 5 Hours.** Theoretical and substantive issues in the study of nonhuman primates and hominids, as represented in current journals and topical volumes.

**437. Bioarchaeology. 5 Hours.** Provides an overview of mortuary theory and the bioarchaeological methods used to study health and disease, diet, activity patterns, kinship and cultural practices in archaeological populations. Prerequisite: consent of the instructor.

**440. The Experience of Culture Difference: Culture Shock. 4 Hours.** Explores experience of different cultures, the process of learning a different culture, and issues arising from the nature of the encounter in fieldwork. Prerequisite: One course in social or cultural anthropology, or experience in another culture.

**441. Psychoanalytic Anthropology I: Cross-Cultural Theory. 4 Hours.** Introduction for social scientists to psychoanalytic theory and methods including Freud's theories and more recent developments. Cross-cultural tests and applications of psychoanalytic theories. Prerequisite: One course in anthropology or psychology, or consent of the instructor.

**442. Psychoanalytic Anthropology II: Cross-Cultural Applications. 4 Hours.** Explores ways in which anthropologists and analysts have used psychoanalysis to understand individuals, practices and institutions of other cultures. Prerequisite: Anth 441 or consent of the instructor.

**443. Leadership: Psychology, Strategy, Culture. 4 Hours.** Psychological and anthropological theories of leadership developed on our culture will be tested against descriptions of leadership in diverse non-Western societies. Prerequisite: One course in anthropology.

**444. Dreams, Dreaming, and Dream Beliefs. 4 Hours.** The dreaming experience examined from the point of view of psychological interpretation, laboratory experiments, and anthropological study of dreams in other cultures. Prerequisite: One course in anthropology or psychology, or consent of the instructor.

**453. Seminar in Cultural Ecology. 4 Hours.** Same as Geog 453. Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture. Prerequisite: Anth 101 or Geog 151 or consent of the instructor.

**470. Classic Ethnographies. 4 Hours.** Analysis of method and theory reflected in selected classic anthropological works, studied in their historical contexts and contemporary uses. Prerequisite: Anth 101 or 213 or consent of the instructor.

**471. Spanish Culture and Society. 4 Hours.** Same as LALS 471 and Span 471. Introduction to themes in Spanish culture and society based primarily upon the literature in anthropology. Parallel sets of readings in Spanish and English.

**472. Problems in European Ethnology. 4 Hours.** A reading and research course designed to acquaint students with the ethnology of rural Europe through in-depth study of case materials and analytical approaches. Prerequisite: Anth 213 or consent of the instructor.

**474. Urban Cultures of Africa. 4 Hours.** A study of the indigenous urban centers of sub-Saharan Africa; the multicultural cities of colonial and contemporary Africa, and the processes of detribalization.

**475. Problems in South American Ethnology. 4 Hours.** Same as LALS 475. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given to the influence of Levi-Strauss's ideas on the formulation of cultural theory in South America. Prerequisite: Anth 213 or consent of the instructor.

**479. Culture and Colonialism in South Asia. 4 Hours.**

Same as AsSt 479 and Hist 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

**480. Sociolinguistics. 4 Hours.** Same as Ling 480. Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. Prerequisites: Ling 405 or consent of the instructor.

**481. Geographic Information Systems I. 4 Hours.** Same as Geog 481. Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files. Geocoding. Prerequisites: Geog 100 and one from Geog 278 or 386 or IDS 100, or consent of the instructor.

**482. Geographic Information Systems II. 4 Hours.** Same as Geog 482. Application of inferential statistical techniques and probability models in geographic research. Topics include use of descriptive parameters in recognizing geographic relationships, tests of significance, and recognition of areal patterns. Prerequisite: Anth 481 or consent of the instructor.

**483. Geographic Information Systems III. 4 Hours.** Same as Geog 483. Problems encountered in the analysis and portrayal of geographic data. Topics include taxonomy, regionalization, trend surface analysis, time series, Markov probabilities, and computer cartographic procedures for displaying output from analytic procedures. Prerequisite: Anth 482 or consent of the instructor.

**484. Mapping with Microcomputers. 4 Hours.** Same as Geog 478. Microcomputer applications including computer principles for mapping, alternative design for coordinate files, kinds of devices for mapping, direct control of devices for mapping, characteristics and limitations of mapping programs. Prerequisite: Geog 475 or consent of the instructor.

**490. Independent Study. 1 to 6 Hours.** May be repeated for a maximum of 8 hours of credit with the approval of the department. Students may register for more than one section per term. Independent reading under the supervision of a faculty member. Prerequisite: Consent of the instructor.

**494. Special Topics in Anthropology. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Reading, study, and discussion of selected problems for graduate students and majors in anthropology. Prerequisite: Approval of the department.

**500. Social and Cultural Theory I. 4 Hours.** Historical survey of approaches to field and library research in anthropology.

**501. Social and Cultural Theory II. 4 Hours.** Continuation of Anth 500. Prerequisite: Anth 500.

**502. Theory and Method in Archaeology. 4 Hours.** Middle-range and general theory in prehistoric archaeology: the reconstruction of prehistoric economic, social, and political systems; cultural materialism and its critiques; cultural ecology and systems theory; social evolution.

**503. Hominid, Phylogeny, and Adaptations. 5 Hours.** Data, methods, and approaches for reconstruction of geneological relationships of species; interpretation of adaptations of extinct species in an evolutionary context.

**509. Seminar in Anthropological Theory. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Issues in the theory and method of anthropology. Prerequisite: Anth 500 or consent of the instructor.

**510. Seminar in Social Organization. 4 Hours.** May be repeated for credit. Theoretical and substantive issues. Prerequisites: Anth 400 or 410 or consent of the instructor.

**511. Comparative Agricultural Systems. 4 Hours.** Comparison of lowland tropical and highland agricultural systems, especially in native Latin America. Agricultural origins; ecology and social organization of agriculture; cognitive organization in belief systems; applications of native knowledge. Prerequisites: One course in archaeology or social anthropology and consent of the instructor.

**512. Comparative Political Systems. 4 Hours.** Structural, dialectical and processual models for the analysis of political action in non-western and preliterate societies; state formation and the question of political change. Prerequisite: One course in anthropology or consent of the instructor.



**514. Gender Issues in Cross-Cultural Perspectives. 4 Hours.** Same as WS 514. Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. Prerequisites: Anth 500 or consent of the instructor.

**520. Seminar in Archaeological Theory and Method. 4 Hours.** May be repeated for credit. Theoretical and substantive issues in the study of prehistory and the recovery and interpretation of the archaeological record. Prerequisite: Anth 402 or consent of the instructor.

**521. Analysis of Stone Artifacts. 4 Hours.** Analyzing stone objects.

**522. Ancient Mesoamerican Calendar Systems. 4 Hours.** Study of the ancient Mesoamerican calendar systems.

**530. Seminar in Physical Anthropology. 5 Hours.** A critical examination of current literature on methods and theories dealing with the evolution of primate biology and behavior.

**531. Anthropological Genetics. 4 Hours.** Basic overview of genetic theory and techniques, followed by a survey of the contributions of human genetics to human adaptation and evolution. Prerequisite: Grade of B or better in Anth 508; or Grade of B or better in Bios 220; or consent of the instructor.

**532. Advances in Ancient DNA. 4 Hours.** Basic techniques and special concerns in the application of molecular biology techniques to the study of ancient DNA, followed by a discussion of recent advances and contributions to the field. Prerequisites: Grade of B or better in Anth 531 or Grade of B or better in Bios 220.

**533. Lab Methods for Ancient DNA. 2 Hours.** Provides students with laboratory training in molecular biology techniques commonly used in studies of ancient DNA. Prerequisite: Consent of the instructor.

**570. Regional Application of Anthropology. 4 Hours.** May be repeated for credit. The application of a specific theory or the testing of competing theoretical frameworks to data provided by one of the major geographical or cultural areas of the world. Emphasis on deductive reasoning and the derivation and testing of hypotheses with data from several cultures of a single culture area.

**590. Developmental Sources of Anthropological Theory. 4 Hours.** Seminar on sources relevant to the development of anthropological theory, principally those deriving from interaction among the subfields of anthropology but also from other disciplines.

**594. Special Topics in Anthropology. 4 Hours.** May be repeated for a maximum of 9 hours credit. Students may register for more than one section per term. Study of selected topic in anthropology.

**595. Graduate Seminar in Anthropology. 1 Hour.** S/U grade only. Presentations of current research by faculty followed by student discussion. Course is to be taken during student's first year in the graduate program as one of the core courses. Prerequisite: Admission to the graduate program in anthropology.

**596. Independent Study. 2 to 6 Hours.** May be repeated for a maximum of 12 hours of credit with the approval of the department. Students may register for more than one section per term. Independent research is done under the supervision of a faculty member. Prerequisites: Consent of the instructor.

**597. Project Research. 2 to 6 Hours.** S/U grade only. Students may register for more than one section per term. The student will do an independent research project with the aid of a faculty advisor. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Research on doctoral dissertation topic. Prerequisite: Advancement to candidacy for the PhD in Anthropology.

## Architecture (Arch)

**405. Architecture Design Lecture I. 2 Hours.** Process of architecture as a synthesis of diverse forces into formal compositions. The struggle to integrate architectural wholes at smaller scales. Prerequisites: Arch 362 and concurrent registration in Arch 406.

**406. Architecture Design Laboratory I. 4 Hours.** Laboratory case study component of Arch 405. Prerequisites: Arch 362 and concurrent registration in Arch 405.

**407. Architecture Design Lecture II. 2 Hours.** Process of architecture as a synthesis of diverse forces into formal compositions. The struggle to integrate architectural wholes at large scales.

Prerequisites: Arch 405 and 406 and concurrent registration in Arch 408.

**408. Architecture Design Laboratory II. 4 Hours.** Laboratory case study component of Arch 407. Prerequisites: Arch 405 and 406 and concurrent registration in Arch 407.

**410. Development of Architectural Theory. 4 Hours.** The relationship of architectural works to their cultural, technical and critical contexts; historical development of architectural thought. Prerequisite: Graduate standing in the MArch Program.

**411. Theory and Critical Analysis in Architecture. 4 Hours.** Architectural theory and criticism from historical and contemporary examples; development of architectural theory and relationship between architecture and architectural criticism. Prerequisites: Arch 410 and graduate standing in the MArch Program.

**412. Women and the Environment. 4 Hours.** Same as GWS 412. Women's place in the built environment; the role of gender in environmental experience including women as users, designers, planners, policy makers, and critics.

**430. Computers in Architecture. 4 Hours.** The theory, tools and techniques in applications of the computer as a design tool, production and presentation medium of 2D and 3D architectural design and building science. Prerequisite: Graduate standing in the Master of Architecture program.

**442. Theory of Architecture and Building Analysis. 4 Hours.** Introduction to discipline of architecture considering symbolic and use patterns, compositional, spatial and typological patterns. Prerequisite: Graduate standing in the MArch Program.

**443. Professional Practice I. 2 Hours.** Legal and ethical considerations in architectural practice; operation and management guidelines. Overview of the history of the professional architectural practice. Prerequisite: Completion of the second plateau or consent of the school.

**444. Professional Practice II. 2 Hours.** Business and financial considerations in architectural practice; scope of services communications and marketing guidelines. Interrelationship with clients, consultants, collaborators, and the manufacturing and construction industry. Prerequisites: Arch 443 and consent of the school.

**451. Introduction to Architectural Design I. 6 Hours.** Visual communication of architectural concepts through two and three dimensional methods; orthographic and paraline drawings, perspective and models. Development of architectural concepts and solution of simple architectural problems. Prerequisite: Graduate standing in the MArch Program.

**452. Introduction to Architectural Design II. 6 Hours.** Architectural design with emphasis on the structural and technical determinants of buildings. Functional analysis of buildings and communication of designs through two and three dimensional techniques. Prerequisite: Arch 451 and 461.

**453. Architectural Design I. 6 Hours.** Design of housing in an urban context; analysis and theory of urban fabric and infrastructure; emphasis on architectural form and its relationship to societal factors and user needs. Prerequisites: Arch 452, 462, and 471; or approval of the department; or graduate standing in the MArch III with Advanced Standing (two-year) program.

**454. Architectural Design II. 6 Hours.** Design of a public building as a comprehensive design; emphasis on site, context, zoning, codes, structural/mechanical systems, and materials in relation to aesthetics. Integration with Arch 464 course material. Prerequisites: Arch 453, 463, 472 and 485; or graduate standing in the MArch III with Advanced Standing (two-year) program.

**459. Introduction to Building Science I: Ethics in Building. 4 Hours.** Requires concurrent registration in Arch 305 and 306. Examines the architect's role in protecting the health, safety and welfare of the public through responsible and ethical building practices. Prerequisite: Approval of the school.

**460. Introduction to Building Science II: Technics in Building. 4 Hours.** Introduction to building construction processes, terminology, principles, conventions, standards, applications, restrictions and communications pertaining to construction materials and assemblies. Prerequisite: Arch 459 or approval of the school.

**461. Building Science I: Ethics in Building. 4 Hours.** Examines the architect's role in protecting the health, safety, and welfare of the public through responsible and ethical building practices. Prerequisites: Approval of the school and enrollment in the Master of Architecture program.

**462. Building Science II: Technics in Building. 4**

**Hours.** Introduction to building construction processes, terminology, principles, conventions, standards, applications, restrictions, and communications pertaining to construction materials and assemblies. Prerequisite: Arch 461.

**463. Building Science III: Systems in Building. 4**

**Hours.** Analysis and integration of architectural building systems. Building envelope, mechanical, electrical, plumbing, vertical transportation, life safety, and structural systems are examined. Prerequisite: Arch 462.

**464. Building Science IV: Theory in Building. 4 Hours.**

Exploration into the concept of Total Building Performance. Exploration of conceptual and philosophical issues related to the application of advanced technology in the design, construction and use of buildings. Prerequisite: Arch 463.

**470. Structures I: Structural Analysis. 4 Hours.**

Introduction to the analysis of structural elements. Introduction to fundamental structural planning criteria and relevant concepts of tension, compression and bending. Introduction to historical and contemporary structural precedents. Prerequisites: Math 180; and Phys 105 and 106.

**471. Structures II: Material Science. 3 Hours.**

Introduction to material properties; strength characteristics of building materials and material assemblies; stress and strain; rigidity and deformation; temperature effects; torsion effects; combined loading of elements and systems. Prerequisites: Arch 470. and approval of the school.

**472. Structures III: Structural Analysis and Material Science. 4 Hours.**

Advanced analysis of structural elements including: fundamental structural planning criteria; stability and rigid body equilibrium; material properties/strength characteristics; historical and contemporary structural precedents. Prerequisite: Graduate standing in the Master of Architecture program. Spring of every year.

**473. Structures IV: Analysis and Design of Steel and Timber Structures. 4 Hours.**

Introduction to the planning, analysis and design of structural steel and timber assemblies. Prerequisites: Arch 470 and 471; or 472; and graduate standing. in the Master of Architecture program.

**474. Structures V: Analysis and Design of Reinforced Concrete and Masonry Structures. 4 Hours.**

Introduction to the planning, analysis and design of reinforced concrete and masonry structures. Prerequisites: Arch 473 and graduate standing in the Master of Architecture program.

**475. Design of Structural Systems. 4 Hours.** Design of structural systems for buildings ranging from high-rise to long-span. Emphasis is placed on conceptual design of systems for gravity, wind and earthquake loads. Prerequisites: Arch 474 and graduate standing in the MArch Program.

**476. Advanced Structural Analysis and Design. 4**

**Hours.** Exploration of advanced methods for analysis of structures and foundations, along with associated methods of design. Use of computers in structural engineering is introduced. Prerequisites: Arch 475 and graduate standing in the MArch Program.

**485. Theories of Urbanism. 4 Hours.**

Introduction to the processes shaping the city and the theories of urbanism, urban infrastructure and urban landscape from the middle of the nineteenth century to the present. Prerequisite: Graduate standing in the MArch Program.

**486. Urban Ecologies and Infrastructures. 4 Hours.**

Introduction to dynamic relationship of ecology and infrastructure in the context of contemporary urban landscape. Built and natural environments as inseparable networks of a dynamic process. Prerequisite: Graduate standing in the Master of Architecture program.

**491. Architectural Study Abroad. 0 to 17 Hours.**

May be repeated for a maximum of 34 hours of credit. Lectures, seminars, studio and independent travel/study abroad. Architectural design, planning, structures, history and technology. Prerequisites: Completion of at least one year of architectural graduate course work, 3.00 cumulative grade point average in architecture, and approval of the school.

**494. Special Topics in Architecture. 2 to 4 Hours.**

May be repeated for a maximum of 8 hours of credit. Current problems. Prerequisites: 12 hours of history of architecture and art and graduate standing in the MArch Program.

**499. Architecture Elective II. 2 to 6 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Special problems in theory, design, building science, or graphic skills (manual or automated). Prerequisite: Completion of architecture graduate course work, or consent of the instructor.

**510. Advanced Architectural Design I. 8 Hours.** Design of multiple or complex building types with emphasis on varying topics related to architectural design. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school.

**511. Advanced Architectural Design II. 8 Hours.** Design of a comprehensive, single case study with emphasis on varying topics related to architectural design. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596.

**512. Advanced Architectural Design I: Activist Practice. 8 Hours.** Design of multiple or complex building types with an emphasis on the theoretical, technical, political and economic considerations relating to community activism and identity politics. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school.

**513. Advanced Architectural Design II: Activist Practice. 8 Hours.** Design of a comprehensive, single case study with emphasis on theory and site planning, interior space, building systems and materials relating to community activism and identity politics. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596.

**514. Advanced Architectural Design I: Architectural Technologies. 8 Hours.** Design of multiple public buildings with an emphasis on the relationship of aesthetics and construction methods in the making of comprehensive architecture. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school.

**515. Advanced Architectural Design II: Architectural Technologies. 8 Hours.** Design of a single public building with an emphasis on the relationship of aesthetics and construction methods in the making of comprehensive architecture. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596.

**516. Advanced Architectural Design I: Digital Media. 8 Hours.** Design of multiple or complex building types with an emphasis on the theoretical, technical, societal, and economic considerations relating to digital media. Extensive computer use required. Prerequisites: Arch 430 and Arch 454 and Arch 464 and Arch 474, or approval of the school.

**517. Advanced Architectural Design II: Digital Media. 8 Hours.** Design of a comprehensive, single case study with emphasis on theory and site planning, interior space, building systems, and materials relating to digital media. Extensive computer use required. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596.

**518. Advanced Architectural Design I: Landscape Urbanism. 8 Hours.** Design of urban landscapes and public spaces as informed by large scale infrastructures, natural environments, and urban systems. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school.

**519. Advanced Architectural Design II: Landscape Urbanism. 8 Hours.** Design of public building and/or space including surrounding urban landscape with emphasis on perceptual, phenomenal, and temporal aspects of design. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596.

**520. Advanced Elective in Activist Practice. 4 Hours.** Study of contemporary theories and practices in community activism and identity politics.

**521. Advanced Elective in Architectural Technologies. 4 Hours.** Examination and analysis of influences on architecture relating to concept, program, function, location, cost, systems, regulation, materials, assemblage, and environmental influences on the resulting building aesthetic.

**522. Advanced Elective in Digital Media. 4 Hours.** Study of contemporary theories and practices in digital media and its relation to architecture.

**523. Advanced Elective in Landscape Urbanism. 4 Hours.** Examination of urban landscape projects from historical, theoretical, ecological, and infrastructural points of view.

**524. Advanced Elective: Special Topics. 4 Hours.**

Advanced study in varying topics related to architecture.

**596. Independent Study for Graduate Students. 1 to 8 Hours.**

May be repeated for a maximum of 16 hours of credit. Individual study. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554; and approval of the department.

**598. Thesis Research. 0 to 16 Hours.** May be repeated for a maximum of 6 hours of credit. S/U grade only. Individual research under faculty direction. Prerequisite: Approval of the school.

## **Art and Design (AD)**

**400. Foreign Studies in Art and Design. 1 to 16 Hours.**

Graduate credit only with approval of the director of the school and the director of graduate studies. S/U grade only. May be repeated for credit with the approval of the appropriate major area faculty committee, the director of the school and/or director of graduate studies. Study abroad within approved programs of foreign exchange and/or education. Prerequisites: Graduate standing within a major program within the School of Art and Design and approval of the appropriate major area faculty committee, director of the school and/or director of graduate studies.

**401. Overview of Art Therapy. 4 Hours.** Principles and practice of art therapy for teachers, mental health workers, prospective art therapy graduate students, and others interested in the field.

**402. Design Professional Practice. 3 Hours.** Professional practice and management, proposals, contracts, and legal issues for designers. Prerequisites: Admission to the graphic design or industrial design major programs and approval of the school.

**403. Design Colloquium. 2 Hours.** May be repeated for a maximum of 4 hours of credit. Lectures, presentations, and/or demonstrations related to design issues impacting on the professions of graphic design and industrial design. Prerequisite: 8 credit hours of 200-level graphic design or industrial design major courses or the equivalent.

**406. Advanced Special Topics in Art and Design. 2 to 5 Hours.** May be repeated for credit. Intensive workshops in specific art and design related topics and techniques directed and announced by the instructor. Prerequisite: Consent of the instructor.

**408. Computer Art-Design. 5 Hours.** May be repeated for a maximum of 15 hours of credit. The computer as a tool for the artist-designer. The design of interactive computer experiences and the production of computer animations. Prerequisite: AD 205 or high-level programming language experience.

**409. Electronic Media Events. 5 Hours.** May be repeated for a maximum of 15 hours of credit. Using video production tools and computer graphic systems to produce a public event. Prerequisite: AD 208 or 408.

**410. Advanced Special Topics in Graphic Design. 1 to 5 Hours.** May be repeated for a maximum of 10 hours of credit. Intensive workshops in specific graphic design related topics and techniques directed and announced by the instructor. Extensive computer use required. Prerequisites: AD 315 and consent of the instructor. Portfolio review required.

**411. Graphic Design Professional Practice. 5 Hours.** Design projects with real-world clients in the private or public sector. The designer/client relationship. Prerequisites: AD 315 and AD 317 and consent of the instructor.

**412. Graphic Design Thesis. 5 Hours.** May be repeated for a maximum of 10 hours of credit. Thesis topics chosen in consultation with graphic design faculty. Prerequisites: Credit or concurrent registration in AD 315; and credit or concurrent registration in AD 317; and credit or concurrent registration in AD 411; and consent of the instructor.

**414. Interactivity in Graphic Design. 5 Hours.** Advanced examination of graphic design in the new media technologies. Extensive computer use required. Prerequisites: AD 315; and credit or concurrent registration in AD 412.

**415. Graphic Design Seminar. 5 Hours.** Seminars and lectures conducted by faculty, design professionals, and individuals from design-related disciplines. Prerequisites: AD 315 and AD 317; and consent of the instructor.

**418. Independent Study in Graphic Design. 1 to 5 Hours.** May be repeated for a maximum of 10 hours of credit. Supervised independent study in graphic design. Extensive computer use

required. Prerequisites: Consent of the instructor. Taken by faculty invitation only.

**419. Typography III. 5 Hours.** Advanced experimental typography. Prerequisites: AD 319 and portfolio approval.

**420. Industrial Design VI. 5 Hours.** May be repeated for a maximum of 10 hours of credit with industrial design faculty committee approval. Students may register for more than one section per term. Planning of advanced product systems with group projects based on international contexts, human/environmental factors analysis, and advanced technological processes. Advanced audio-visual presentations and technical reports. Prerequisites: Completion of 8 hours of AD 320 and 321 or the equivalent and approval of the school.

**421. Industrial Design VII. 5 Hours.** May be repeated for a maximum of 10 hours of credit with industrial design faculty committee approval. Students may register for more than one section per term. Group projects with planning of advanced product systems based on international contexts, human/environment factors analysis, and advanced technological processes. Advanced audio-visual presentations and technical reports. Prerequisites: Completion of 8 hours of AD 320 and 321 or the equivalent and approval of the school.

**422. Interaction Design II. 5 Hours.** Extensive computer use required. Advanced 2-D and 3-D methods in the design of interactive products and art works. Includes human factors, 3-D modeling and design of 3-D virtual products. Prerequisites: AD 325; or consent of the instructor.

**423. Industrial Design Senior Project. 5 Hours.** Application of the principles of problem-solving and industrial design communication methodology to the organization and presentation of a faculty approved senior or graduate project. Prerequisites: AD 422 or the equivalent and approval of the school.

**424. Industrial Design Independent Study. 4 to 8 Hours.** May be repeated for a maximum of 16 hours of credit. Supervised independent study in any area of industrial design activity not covered in the regular curriculum. Prerequisites: Completion of 8 hours of AD 320 and 321 or the equivalent and approval of the school.

**425. Design Visualization. 5 Hours.** May be repeated for a maximum of 15 hours of credit. Extensive computer use required. Advanced applications of computer-aided design software, including 3-D surface modeling and solid modeling. Applied computer-aided manufacturing, robotics, and expert systems. Prerequisite: AD 325 and consent of the instructor.

**432. Painting III: Advanced. 5 Hours.** May be repeated for a maximum of 15 hours of credit. Advanced painting; emphasis on individual creative initiative and development, in concert with understanding of contemporary formal, expressive, and conceptual issues. Prerequisites: 8 hours of AD 231; and AD 241 and AD 251 and AD 391; or consent of the instructor with portfolio review.

**442. Sculpture III: Advanced. 5 Hours.** May be repeated for a maximum of 15 hours of credit for graduate students. Independent projects with faculty supervision. Experimentation and in-depth study of contemporary concepts, processes, and techniques to develop a personal, creative, visual language; primarily self-directed. Prerequisites: AD 231 and AD 241 and AD 251 and AD 391; or approval of the school.

**460. Advanced Photography. 5 Hours.** Instructor originated projects in any area of photographic activity.

**461. Photography Tutorial. 5 Hours.** Student generated projects.

**470. Documentary Film/Video Production. 5 Hours.** Group or individual projects dealing with the communication of fact through motion picture or video media. Prerequisite: AD 272 or consent of the instructor.

**471. Advanced Film/Video/Animation. 5 Hours.** May be repeated for a maximum of 15 hours of credit. Investigation of contemporary concerns in various areas of film and/or video activity under the direction of an instructor. Prerequisites: AD 272 or 474 and consent of the instructor.

**472. Independent Study in Film/Video/Electronic Visualization. 4 to 12 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one four-hour section per term, or repeat the course in four-hour sections in subsequent terms. Supervised independent study in any areas of cinema, video production, or electronic visualization. Prerequisites: 12 hours in any film, video, and/or electronic visualization courses and consent of the instructor.



**474. Advanced Animation. 5 Hours.** May be repeated for a maximum of 20 hours. Students may register for more than one section per term. Applications of advanced methods in film animation. Creative projects utilizing sound synchronization, computer motion synthesis, and related techniques. Prerequisite: AD 274.

**478. Video II. 5 Hours.** May be repeated for a maximum of 12 hours of credit. Creative projects using small format video systems. Prerequisite: AD 278.

**484. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the school. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the school.

**485. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the school. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in AD 484, and approval of the school.

**488. Computer Graphics I. 4 Hours.** Same as CS 488. Principles of interactive computer graphics. Raster and vector display, techniques, and hardware considerations. Introduction to two-dimensional and three dimensional rendering. Laboratory. Prerequisite: Credit or concurrent registration in CS 370.

**492. Studio Seminar III. 4 Hours.** Rigorous examination of historical developments in art as the basis for understanding new approaches to the continuum of contemporary art. Prerequisites: AD 231 and AD 241 and AD 251 and AD 391; and credit or concurrent registration in AD 432 or credit or concurrent registration in AD 442; or approval of the department.

**494. Special Topics in Art Therapy. 2 to 5 Hours.** May be repeated for a maximum of 10 hours of credit. Students may register for more than one section per term. Specializations, new developments in the field, in-depth study of theory, process, application, or independent study. Prerequisite: Consent of the instructor.

**499. Cooperative Education. 0 to 4 Hours.** May be repeated for credit. S/U grade only. Only 8 hours of credit may be counted toward satisfying requirements for any art and design major. Introduction to professional practice offering students the opportunity to couple academic learning with professional experience in an off-campus placement. Prerequisites: A minimum cumulative grade point average of 3.00 and approval of the school.

**500. Art and Design Teaching Internship. 0 to 2 Hours.** This course may be repeated. Practical and theoretical aspects of teaching lecture/lab studio, and/or seminar courses in art and design. No graduation credit. Prerequisites: Consent of the instructor, and consent of Director of Graduate Studies.

**502. Seminar in Contemporary Theory. 4 Hours.** Must be repeated for a minimum of 16 hours of credit. Developments and current issues in contemporary design, studio and media arts: major philosophies, debates, and social/environmental aspects (may include visiting lecturers, critics, and discussants). Prerequisites: Approval of the school, graduate faculty committee and the student's advisor.

**507. Special Projects in Art and Design. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. Student initiated projects not covered in available curriculum. Prerequisites: Consent of the sponsoring instructor and the graduate faculty committee in the student's area of specialization.

**508. Advanced Electronic Visualization and Critique. 4 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in electronic visualization through a consultative agreement with graduate faculty committee. Prerequisite: Approval of the school graduate faculty committee.

**509. Advanced Electronic Visualization. 5 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in electronic visualization through a consultative agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student's advisor.

**510. Advanced Graphic Design and Critique. 4 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in graphic design by each student through

consultative agreement with graduate faculty committee. Prerequisites: Approval of the school graduate faculty committee.

**511. Advanced Graphic Design. 5 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in graphic design by each student through consultative agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student's advisor.

**520. Advanced Industrial Design and Critique. 4 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in industrial design by each student through consultative agreement with graduate faculty committee. Prerequisites: Approval of the school graduate faculty committee.

**521. Advanced Industrial Design. 5 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in industrial design by each student through consultative agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student's advisor.

**530. Advanced Studio Arts and Critique. 4 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in studio arts by each student through consultative agreement with graduate faculty committee. Prerequisite: Approval of the school graduate faculty committee.

**531. Advanced Studio Arts. 5 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in studio arts by each student through consultative agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student's advisor.

**550. Introduction to Art Therapy. 4 Hours.** History, theory, and professional issues in art therapy. Prerequisite: Admission to the MA in art therapy program.

**551. Art Therapy Methods. 4 Hours.** Utilization of art materials for specific client needs; evaluating art work in relation to developmental level and psychodynamic functioning; assessment and treatment planning. Prerequisite: Admission to the MA in art therapy program.

**552. Group Art Therapy. 4 Hours.** Principles and skills of group art therapy including application to various populations. Prerequisite: Admission to the MA in art therapy program.

**553. Career Counseling with Art Therapy. 1 Hour.** Overview of history, theory, and techniques of career development with adolescent and adult clients in art therapy. Prerequisite: Admission to the MA in art therapy program.

**554. Art Therapy Studio. 4 Hours.** Analysis of the art therapy experience through art-making, including use of materials, creativity, self image, and therapeutic processes. Prerequisite: Admission to the MA in art therapy program.

**555. Art Therapy Practicum. 4 Hours.** Must be repeated for 12 hours of credit. In-depth experience in clinical, educational, or rehabilitative setting in which student conducts art therapy under weekly supervision. Prerequisite: Consent of the art therapy program director.

**556. Supervision Seminar I: Assessment. 3 Hours.** Art therapy assessment in combination with small group clinical supervision. Prerequisites: AD 550, AD 551, and concurrent registration in AD 555.

**557. Supervision Seminar II: Ethics and Professional Practice. 3 Hours.** Professional ethics and practice in combination with clinical supervision seminar. Prerequisites: AD 550, AD 551, and concurrent registration in AD 555.

**558. Supervision Seminar III: Termination. 3 Hours.** Final seminar of clinical supervision with a focus on treatment termination and review of training. Prerequisites: AD 550, AD 551, 8 hours of AD 555, and concurrent registration in AD 555.

**560. Advanced Photography and Critique. 4 Hours.** May be repeated for credit. A forum for presenting and discussing individual work with all photography graduates and faculty participating. Prerequisite: Approval of the school graduate faculty committee.

**561. Advanced Photography. 5 Hours.** May be repeated for credit. Individualized graduate study; creative projects and research in photography by each student through consultative agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student's advisor(s).

**569. Photography/Film/Electronic Media Colloquium. 2 Hours.** May be repeated for a maximum of 8 hours of credit. Films,



lectures, and discussion relating to photography, film, and electronic media.

**570. Advanced Film/Animation/Video and Critique. 4 Hours.** May be repeated for credit. Individualized graduate study; projects for creative research in film, video, and animation by each student through conference and consultive agreement with graduate faculty committee. May involve supportive consultation in other areas. Prerequisite: Approval of the school graduate faculty committee.

**571. Advanced Film/Animation/Video. 5 Hours.** May be repeated for credit. Individualized graduate study; projects for creative research in film, video, and animation by each student through consultive agreement with graduate advisor. May involve supportive consultation in other areas. Prerequisites: Approval of the school graduate faculty committee and the student's advisor.

**581. Child and Family Art Therapy. 2 Hours.** Art development in normal childhood and under pathological conditions; family system dynamics; art therapy interventions with children and families in various treatment contexts. Prerequisites: AD 550 and AD 551.

**582. Art Therapy for Substance Abuse. 1 Hour.** Art therapy interventions in the treatment of substance abuse. Prerequisite: AD 550 and AD 551.

**583. Multicultural Diversity in Art Therapy. 1 Hour.** Issues of ethnicity, class, physical disability, women, sexual preference; art therapy with elderly, homeless, chronically mentally ill; considerations for art therapy treatment. Prerequisites: AD 550 and AD 551.

**588. Computer Graphics II. 4 Hours.** Same as CS 526. State of the art in computer graphics and interactive techniques: Three-dimensional surface and volumetric models. A laboratory is required. Prerequisite: CS 488.

**594. Special Topics in Art and Design. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specialized research topics in art and design directed and announced by the instructor. Prerequisites: Consent of the instructor and the student's advisor.

**597. Master's Project. 0 to 16 Hours.** May be repeated for a maximum of 16 hours of credit. S/U grade only. Independent research under faculty supervision in a specific area of interest. Prerequisites: 20 hours of 500-level courses and consent of the instructor.

**598. Master's Thesis Research: Art Therapy. 0 to 16 Hours.** Must be repeated for a total of 8 hours of credit. S/U grade only. Independent research under faculty supervision in an area of the student's interest. Prerequisite: Approval of the art therapy program director.

## Art History (AH)

**404. Topics in Architecture, Art and Design. 4 Hours.** May be repeated for a maximum of 12 hours of credit when topics vary. Students may register for more than one section per term when topics vary. Selected topics in the history of European and North American architecture, art, and design. Prerequisite: 3 hours of art history at the 200 level or consent of the instructor.

**420. History of Architecture I. 4 Hours.** Introduction to architecture, urbanism, and architectural theory worldwide from antiquity to 1450.

**421. History of Architecture II. 4 Hours.** Introduction to architecture, urbanism, and architectural theory worldwide from 1450 to the present. Prerequisite: AH 420.

**422. Topics in the Literature of Architecture. 4 Hours.** May be repeated for credit when topics vary. Discussion of selected readings in the theory and criticism of architecture. Prerequisite: 3 hours in the history of architecture or consent of the instructor.

**423. Topics in Modern and Contemporary Architecture. 4 Hours.** May be repeated for credit when topics vary. Selected topics in modern and contemporary architecture. Prerequisite: 4 hours in the history of architecture or consent of the instructor.

**424. Topics in Architecture and Urban Form in Chicago. 2 to 4 Hours.** Topics on the development of the built environment of the Chicago and metropolitan area, and the effect on its architecture of social, political, and economic forces.

**430. Contemporary Photography. 4 Hours.** May be

repeated for credit when topics vary. Developments in the history of photography since 1950. Prerequisite: 3 hours in the history of photography or consent of the instructor.

**432. Topics in Film and Video. 4 Hours.** May be repeated for credit when topics vary. Selected studies in genres, schools, individual artists, critics, and theorists of film and video. Prerequisite: 3 hours in the history of film or consent of the instructor.

**434. Women and Film. 4 Hours.** Same as Engl 472 and WS 472. Roles and representations of women in classical Hollywood, European art, and independent feminist cinemas. Prerequisite: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**435. Topics in Modern and Contemporary Design. 4 Hours.** May be repeated for credit when topics vary. Topics in modern and contemporary design. Prerequisite: 3 hours in the history of design or consent of the instructor.

**441. Topics in Medieval Art and Architecture. 4 Hours.** May be repeated for credit when topics vary. Selected topics in European art and architecture of the Middle Ages. Prerequisite: 3 hours of medieval art and architecture or consent of the instructor.

**450. Topics in Renaissance Art. 4 Hours.** Selected topics in Early Renaissance, High Renaissance, or Mannerist Art and Architecture. Prerequisite: 3 hours in art history at the 200-level or above, or consent of the instructor.

**460. Topics in Modern and Contemporary Art. 4 Hours.** May be repeated for credit when topics vary. Selected topics in 19th and 20th century modern and contemporary art. Prerequisite: 3 hours of modern art and architecture or consent of the instructor.

**463. Topics in North American Art and Architecture. 4 Hours.** May be repeated for credit when topics vary. Selected topics in North American art and architecture from colonial times to 1945. Prerequisite: 3 hours of North American art and architecture or consent of the instructor.

**464. Topics on Art in Chicago. 2 to 4 Hours.** Topics on the survey of art in Chicago, from the 19th century to the present, with an emphasis on contemporary Chicago art expressions.

**465. Arts of the Black Atlantic. 4 Hours.** Interdisciplinary and discursive explorations of the visual and artistic expressions of artists of African descent in the New World.

**470. Topics on Non-Western Art and Architecture. 4 Hours.** May be repeated for credit when topics vary. Selected topics in the art and architecture of Africa, Asia, Oceania, and the indigenous peoples of the Americas.

**471. Topics in Asian Art and Architecture. 4 Hours.** Same as AsSt 471. May be repeated for credit when topics vary. Selected topics in the art and architecture of Asia. Prerequisite: 3 hours of Asian art and/or architecture or consent of the instructor.

**480. History of Collecting and Museology. 4 Hours.** The history of collecting and patronage: public and private collections museums, and commercial art galleries, government funding, and the arts. Prerequisite: AH 110 and 111 or consent of the instructor.

**481. Museum Practices. 4 Hours.** Exhibition planning, research, selection, and catalog preparation. Administration of visual arts organizations, their budgets, staffing, and structures. Prerequisite: AH 480 or consent of the instructor.

**482. Museology Internship. 8 Hours.** Practical supervised experience in institutions serving the visual arts. Placements in museums, community art centers, college, commercial, or nontraditional galleries, and public agencies. Prerequisite: AH 481 or consent of the instructor.

**485. Introduction to Historic Preservation. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Preservation planning, historic building restoration, and the political and economic factors affecting the conservation of historic resources. Prerequisite: 3 hours of art history at the 200 level or consent of the instructor.

**491. Study Abroad in Art History. 0 to 12 Hours.** May be repeated for credit with the approval of the department. Study abroad within an approved foreign exchange program or department-sponsored program. Prerequisite: Approval of the department.

**492. Readings in Art and Architecture History. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Individually planned readings on selected topics under the supervision of a faculty

member. Prerequisites: 3 hours of art history above the 100 level and consent of the instructor.

**510. Historiography of the Visual Arts, 1750 to 1960. 4 Hours.** Analysis of the emergence of a historiography of the visual arts in the modern era, with an analysis of stylistic history, artistic biography, and iconography. Prerequisite: Graduate standing in the art history program or consent of the instructor.

**511. Toward New Histories of the Visual Arts, 1960 to the Present. 4 Hours.** Analysis of the recent consciousness of the ideological configuration and organization of knowledge extending the discipline to issues of gender, class, ethnicity, and popular culture. Prerequisite: Graduate standing in the art history program or consent of the instructor.

**512. Art History Teaching Seminar. 0 Hours.** May be repeated once. S/U grade only. Theoretical and practical aspects of teaching in undergraduate course in the history of the visual arts. Prerequisites: Graduate standing in the art history program and appointment as a teaching assistant in the department.

**522. Issues in Architecture, Design, and Urbanism. 4 Hours.** Theories and contemporary critical issues relating to the history of the environment created and modified by people. Readings and presentations on historic and regional variations.

**530. Seminar in the History of Photography. 4 Hours.** May be repeated for credit when topics vary. Selected topics in the history of photography with emphasis on primary source materials for research purposes.

**541. Seminar in Medieval Art and Architecture. 4 Hours.** May be repeated when topics vary. The art and architecture of Europe during the Middle Ages.

**550. Seminar in Renaissance and Baroque Art and Architecture. 4 Hours.** May be repeated for credit when topics vary. European art and architecture of the Renaissance.

**560. Seminar in Modern Architecture, Art, and Design. 4 Hours.** May be repeated for credit when topics vary. Students may register for more than one section per term. North American and European art, architecture, and design between 1780 and 1945.

**561. Seminar in Contemporary Architecture and Art. 4 Hours.** Selected topics in recent North American or European art, architecture and design. Prerequisite: Consent of the instructor.

**562. Issues in the Art of the Americas. 4 Hours.** Historical, theoretical, and critical issues in the art of the Americas and the Caribbean; indigenous, imported, and diasporan cultures and the interaction between them.

**563. Seminar in North American Architecture and Art. 4 Hours.** May be repeated when topics vary. North American art and architecture from the Colonial period to 1945. Prerequisite: Consent of the instructor.

**570. Seminar in Non-Western Art and Architecture. 4 Hours.** Selected topics in Pre-Columbian, North American Indian, African, and Oceanic Art.

**596. Readings in Art and Architecture. 1 to 4 Hours.** Individually planned readings on selected topics under the supervision of a faculty member. Prerequisite: Consent of the instructor.

**598. Thesis Research. 0 to 16 Hours.** May be repeated for a maximum of 8 hours of credit. S/U grade only. Individual research under faculty direction. Prerequisite: Consent of the instructor.

**599. PhD Dissertation Research. 0 to 16 Hours.** May be repeated for a maximum of 24 hours of credit. S/U grade only. Supervised research on the part of the student. Prerequisites: Consent of the instructor and satisfactory completion of the preliminary examination.

## Asian Studies (AsSt)

**471. Topics in Asian Art and Architecture. 4 Hours.** Same as AH 471. May be repeated for credit when topics vary. Selected topics in the art and architecture of Asia. Prerequisite: 3 hours of Asian art and/or architecture or consent of the instructor.

**472. Issues and Events in Twentieth-Century China. 4 Hours.** Same as Hist 472. Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history.

**473. Topics in East Asian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per

term. Same as Hist 473. Specific topics are announced each term.

Prerequisite: 3 hours of East Asian history or consent of the instructor.

**478. Women in Chinese History. 4 Hours.** Same as GWS 478 and Hist 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution, and the historiography of the field.

**479. Culture and Colonialism in South Asia. 4 Hours.** Same as Anth 479 and Hist 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

## Associated Health Sciences (AHS)

**510. Research Methods in Allied Health. 3 Hours.**

Application of basic concepts of research methodology to allied health, including problem formulation, research design, sampling, measurement, and data analysis. Emphasis on critique of research studies and preliminary proposal writing. Prerequisite: Consent of the instructor.

**520. Systems Theory in Allied Health. 4 Hours.** Focuses on allied health practice in emerging and existing health care systems and emerging medical and social needs of patient care groups. Prerequisite: Consent of the instructor.

**594. Special Topics in Associated Health Sciences. 1 to 4 Hours.** Selected topics of interest within disciplinary specialty areas of the allied health professions. Particular attention is given to topics of cross cutting importance to these professions.

**595. Seminar in Associated Health Sciences. 1 Hour.** S/U grade only. Topics of current interest in a discipline of associated health sciences. Includes discussions of current journal articles and important new developments in the specific disciplines. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/ thesis research.

**597. Project Research in Associated Health Sciences. 1 to 4 Hours.** S/U grade only. Independent investigation of a topic to contribute to the associated health professions. Students investigate a topic/problem in this area, write an article/ report, and/or make an oral presentation. Prerequisite: Consent of the instructor.

## Biochemistry (Bche)

**411. Introduction to Biological Chemistry. 4 Hours.**

Lecture course designed primarily for students in the College of Dentistry. Includes chemistry of cellular constituents; enzymology; metabolism of sugars, proteins, lipids, and nucleic acids; and regulation of metabolism. Prerequisite: Organic chemistry.

**460. Biochemistry. 5 Hours.** Intended primarily for first-year graduate students. Discussions of chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids. Also includes elements of enzymology. Prerequisite: Organic chemistry.

**501. Immunochemistry. 3 Hours.** Same as MIm 501. Immunoglobulin genetics and structure; regulation of immunoglobulin gene expression and generation of antibody diversity; molecular and genetic aspects of lymphocyte receptors and activation. Prerequisites: MIm 451 and Bche 460 and/or consent of the instructor.

**513. Structure of Biopolymers. 3 Hours.** Same as MIm 513 and PmPg 513. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: Bche 460 and a year of physical chemistry; or consent of the instructor.

**516. Physiology and Biochemistry of Muscle Contraction. 2 Hours.** Same as PhyB 516. Structure and function of myosin, actin, tropomyosin, troponin, and the sarcoplasmic reticulum; control, energetics, and mechanism of muscle contraction; gene expression.

**520. Biochemical Research Techniques I. 3 Hours.** Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical methodology. Prerequisites: Organic chemistry and credit or concurrent registration in Bche 460 and consent of the instructor.

**521. Biochemical Research Techniques II. 2 to 5 Hours.** Students carry out assigned projects in each of two different

research laboratories during the semester. Emphasis on the application of biochemical methods in an actual research setting. Prerequisites: Bche 520, graduate standing in the department, and consent of the instructor.

**522. Strategies for Effective Scientific Communication. 1 Hour.** S/U grade only. Development of critical skills for evaluation, development, and execution of forms of scientific communication, including research and grant proposals, manuscripts describing original research, and review summaries. Prerequisite: Consent of the instructor.

**531. Medical Biochemistry I. 3 Hours.** Intended primarily for first year medical students. Chemistry of biopolymers; enzymology; metabolism of carbohydrates, lipids, amino acids and proteins; molecular biology. Prerequisite: Membership in the medical school class or consent of the instructor.

**532. Medical Biochemistry II. 1 Hour.** Intended primarily for medical students. Chemistry of biopolymers; enzymology; metabolism of carbohydrates, lipids, amino acids and proteins; molecular biology. Prerequisites: Bche 531 and membership in the medical school or consent of the instructor.

**533. Nutrition for Medical Students. 2 Hours.** Intended primarily for medical students. Biochemistry and physiology of each of the nutrients. Biochemical and nutritional basis of heart disease, hypertension, metabolic bone disease energy expenditure, obesity, malnutrition, regulation of appetite, foods, cancer, and drug/nutrient interactions. Prerequisites: Bche 531 and 532 and membership in the medical school or consent of the instructor.

**561. Biochemistry of Cellular Regulation. 3 Hours.** Membrane structure and function, transport, receptor and signal transduction mechanisms and growth factors. Cytoskeleton and motility, cell-cell communication, enzyme cascades and cellular control mechanisms. Prerequisite: Bche 460.

**562. Gene Structure and Function. 3 Hours.** DNA organization and gene structure, transcription and translational control of gene expression. Emphasis given to the regulation of gene expression in selected developmental systems. Prerequisite: Bche 460 or consent of the instructor.

**563. Principles of Molecular Medicine. 3 Hours.** A lecture/discussion/writing course which integrates biochemical and molecular biological concepts into a clinical context. Diseases will be described in terms of molecular mechanisms. Prerequisites: Bche 561 and 562; or consent of the instructor.

**594. Special Topics in Biochemistry. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Topics of current interest in the field of biochemistry, and may include NMR structural studies, proteinases and their inhibitors, gene regulation, signal transduction, and transcription factors. Prerequisite: Consent of instructor.

**595. Seminar and Journal Club. 1 Hour.** May be repeated for credit. S/U grade only. Student presentation of research subjects of current importance in biochemistry and related fields, based on current research literature. Prerequisite: Consent of the instructor.

**596. Independent Study in Biochemistry. 1 to 3 Hours.** May be repeated for a maximum of 4 hours of credit. A maximum of 3 hours of credit may be taken with a single instructor. Students may register for more than one section per term. Introduction to current research through the biochemical literature offered on an individual basis by arrangement. Prerequisite: Consent of instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Investigation carried out by MS candidate under the direction of a faculty member leading to the MS in biochemistry. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent investigation carried out by PhD candidate under the supervision of a faculty member leading to the PhD in biochemistry. Prerequisite: Consent of the instructor.

## Bioengineering (Bioe)

**407. Pattern Recognition I. 4 Hours.** Same as ECE 407. The design of automated systems for detection, recognition, classification, and diagnosis. Parametric and nonparametric decision-making techniques. Applications in computerized medical and industrial image and waveform analysis. Prerequisite: Math 220.

**415. Biomechanics. 4 Hours.** Use of rigid and deformable body statics and rigid body dynamics to analyze various aspects of the human musculoskeletal system. Prerequisites: CEMM 204 and ME 210 and either BioS 442 or 443.

**420. Introduction to Field and Waves in Biological Tissues. 4 Hours.** Principles of electromagnetic and ultrasonic interaction with biological systems; characterization of biological materials; diagnostic and therapeutic uses; and techniques of dosimetry and measurement. Prerequisite: ECE 310.

**430. Bioinstrumentation and Measurements I. 4 Hours.** Theory and application of instrumentation used for physiological and medical measurements. Characteristics of physiological variables, signal conditioning devices and transducers. Prerequisites: ECE 210; and either BioS 442 or 443.

**431. Bioinstrumentation and Measurement Laboratory. 1 Hour.** Practical experience in the use of biomedical instrumentation for physiological measurements. Prerequisite: Credit or concurrent registration in Bioe 430.

**432. Artificial Organs. 4 Hours.** The underlying engineering concepts involved in the development, testing and application of artificial organs. Prerequisites: ECE 210; and ChE 311 or ME 211; and Bios 442 or Bios 443.

**433. Artificial Organs Laboratory. 1 Hour.** Laboratory experiments with implantable and extra-corporeal artificial organs. Prerequisite: Credit or concurrent registration in Bioe 450.

**435. Introduction to Bioelectric Phenomena. 4 Hours.** Origin of bioelectric signals. Quasi-static formulation. Volume conduction. Bioelectrical imaging. Image processing. Forward and inverse problems. Biomagnetic fields. Medical application. Prerequisite: ECE 310 or consent of the instructor.

**440. Biological Signal Analysis. 4 Hours.** Analysis of signals of biological origin. Transient signals. Stability analysis. Control. Probabilities, stochastic processes. Medical applications. Prerequisite: ECE 310.

**452. Biocontrol. 4 Hours.** Considers the unique characteristics of physiological systems using the framework of linear systems and control theory. Static and dynamic operating characteristics, stability, and the relationship of pathology to control function. Prerequisites: ECE 310 and either BioS 442 or 443.

**455. Introduction to Cell and Tissue Engineering. 4 Hours.** Foundation of cell and tissue engineering covering cell technology, construct technology, and cell-substrate interactions. Emphasis in emerging trends and technologies in tissue engineering. Prerequisites: Bios 100 and CEMM 260; or the equivalent.

**456. Cell and Tissue Engineering Laboratory. 2 Hours.** Includes polymer scaffold fabrication, microstamping biomolecules, cellular adhesion and proliferation assays, and immo/fluorescent tagging. Prerequisite: Bioe 455; or consent of the instructor.

**460. Materials in Bioengineering. 4 Hours.** Analysis and design considerations of problems associated with prostheses and other implanted biomedical devices. Prerequisites: CEMM 260 and either BioS 442 or 443.

**470. Bio-Optics. 4 Hours.** Physical principles and instrumentation relevant to the use of light in biomedical research. Several current and developing clinical applications are explored. Prerequisite: Phys 142.

**472. Models of the Nervous System. 4 Hours.** Mathematical models of neural excitation and nerve conduction, stochastic models and simulation of neuronal activity, models of neuron pools and information processing, models of specific neural networks. Prerequisites: ECE 310 and either BioS 442 or 443.

**474. Neural Engineering I. 4 Hours.** Same as BioS 474. Characterization, modeling, and design of neural systems, from channels to networks, within the context of potential and existing applications including neuroprosthetics and hybrid devices. Prerequisites: BioE 340 and BioS 442 or consent of the instructor.

**480. Introduction to Bioinformatics. 4 Hours.** Computational analysis of genomic sequences and other high throughput data. Sequence alignment, dynamic programming, database search, protein motifs, cDNA expression array, and structural bioinformatics. Prerequisites: BioS 100 and CS 201 or consent of the instructor.

**494. Special Topics in Bioengineering. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one



section per term. Special topics to be arranged. Prerequisite: Consent of the instructor.

**500. Interfacial Biosystems Engineering. 4 Hours.**

Advanced and detailed exposition of the fundamentals of biological systems using quantitative approaches. Areas of concentration include bioinformatics, cell and tissue engineering, and neuroengineering. Prerequisite: BioS 442.

**507. Pattern Recognition II. 4 Hours.** Applications in nuclear medicine, radiology, remote sensing, speech recognition and cardiology, time-varying image sequences, image operator statistics, feature selection techniques, computer-aided diagnosis and clustering techniques. Prerequisite: Bioe 407.

**509. Pattern Recognition III. 4 Hours.** Recognizing objects in images; representation, segmentation, matching, fitting, edge and curve detection and linking, textures, shapes, projections, symmetry, moments, relaxation techniques, complexity, sharpening, and smoothing. Prerequisite: Bioe 407.

**514. Biotransport. 4 Hours.** Same as ChE 514. Diffusion and flow in living systems. Blood rheology and flow. Microcirculation, oxygen transport, diffusive transport across membranes. Membrane structure; water, and ion flows, active transport. Prerequisite: ChE 410 or consent of the instructor.

**515. Mechanics of the Human Spine. 4 Hours.**

Biomechanics as applied to the human spine. Spinal loading. Experimentation methods and modelling of intact ligamentous spine. Nature and treatment of adolescent idiopathic scoliosis. Thoracolumbar injuries. Prerequisite: BioE 415 or the equivalent.

**520. Wave Propagation and Scattering in Biological Tissue. 4 Hours.**

Inverse and direct solution techniques will be utilized in applications of acoustic, electromagnetic, and radiation transport methodologies to the characterization of biological media. Prerequisite: Bioe 420.

**521. Imaging Systems for Biological Tissues. 4 Hours.**

Examination of major imaging systems using ionizing and nonionizing energy for characterization of biological tissues and physiological lesions. Prerequisite: Bioe 420.

**540. Pattern and Image Modeling of Bioengineering Systems. 4 Hours.**

Estimation of quantitative models of pattern and image data arising from bioengineering experiments. Prerequisite: BioE 440.

**544. Advanced Theory and Technology of Devices. 4 Hours.**

Same as ECE 544. Theory, design, and technology of a selected semiconductor device at current research and industrial state-of-the-art level. Prerequisite: ECE 540.

**550. Principles of Cell and Tissue Engineering. 4 Hours.**

Introduction to tissue engineering. Presents principles of biomedical, biochemical, and biomaterials science applied to tissue engineered organ replacements, implantable medical devices, and drug delivery systems. Prerequisites: BioS 442 or 443; and CEMM 260. A course in cell biology is recommended.

**552. Advanced Biocontrol. 4 Hours.** Modeling and analysis of physiological systems including such topics as adaptive control, statistical analysis, error signal analysis, and the characterization of individual neural control elements. Prerequisite: Bioe 452.

**555. MEMS for Biomedical Engineering. 4 Hours.**

Interaction of biologicals with microfabricated surfaces and devices. Protein immobilization and patterning using microlithography. Biointegration and packaging. Biomedical examples of MEMS. Prerequisite: ECE 400.

**560. Processing and Properties of Structural Biomaterials. 4 Hours.**

Considers the interrelationships between atomic bonding, atomic/molecular structure and material processing to provide a fundamental understanding of the properties and performance of advanced biomaterials. Prerequisite: CEMM 260. Credit in Bioe 460 is recommended.

**575. Neural Engineering II. 4 Hours.** Neuron and membrane excitation, brain and activation, measurement and processing of neural signals, stimulation of neural tissue, source modeling and neural imaging. Prerequisite: Consent of the instructor.

**579. Neuromuscular Stimulation. 4 Hours.**

Neuromuscular electrical stimulation for ambulation by paraplegics, of upper limb in tetraplegics, of vocal cord and breathing functions, stimulation of cochlea, retina, and visual cortex. Prerequisite: Consent of the instructor.

**590. Internship in Bioengineering. 1 to 4 Hours.** S/U grade only. Current clinical practice experience in a health care setting culminating in a written and oral report. Prerequisites: Bioe 430, 431 and 479.

**594. Advanced Special Topics in Bioengineering. 1 to 4 Hours.**

May be repeated for credit. Students may register for more than one section per term. Systematic review of selected topics in bioengineering theory and practice. Subjects vary from year to year. Prerequisite: Consent of the instructor.

**595. Seminar on Bioengineering. 0 to 1 Hour.**

S/U grade only. May be repeated for credit. Students who are presenting seminars should register for 1 hour, others for 0 hour. Recent innovations in bioengineering theory and practice presented by invited speakers, faculty, and graduate students.

**596. Independent Study. 1 to 5 Hours.**

May be repeated for credit. Students may register for more than one section per term. Research on special problems not included in thesis research. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.**

Students may register for more than one section per term. S/U grade only. Research in MS thesis project.

**599. PhD Thesis Research. 0 to 16 Hours.** Students may register for more than one section per term. S/U grade only. Research in PhD thesis project.

## Biological Sciences (BioS)

**401. Biological Methods for Teachers. 4 Hours.**

Introduction to teaching biology in the secondary schools; methods of instruction; techniques for detecting learning difficulties. Conducted primarily as a practicum. Prerequisites: 32 hours of biological sciences.

**402. Educational Practice with Seminar I. 6 Hours.**

Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**403. Educational Practice with Seminar II. 6 Hours.**

Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in BioS 402 and approval of the department.

**416. Natural Products. 4 Hours.**

Same as Chem 456. Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. Prerequisite: One year of organic chemistry.

**422. Cell and Molecular Biology. 3 Hours.**

The assembly, regulation, and properties of cell components and how they interact during secretion, signal transduction, mitosis, and motility. Emphasis on understanding and interpreting experimental methods. Prerequisite: BioS 220 or the equivalent, or consent of the instructor.

**424. Mammalian Histology. 4 Hours.** The microscopic anatomy of tissues and organs in relation to their function. Prerequisite: BioS 225 or 272.

**426. Ultrastructural Cell Biology. 3 Hours.**

Structure and function of the differentiated, eukaryotic cell; emphasis on electron microscopic studies of cells in vertebrate tissues. Prerequisites: Two years of biological sciences and one year of chemistry required. Chem 232 is highly recommended.

**428. Electron Microscopy. 3 Hours.** Lectures, demonstrations, and discussions of the principles of instrumentation, and specimen preparation of biological material for transmission and scanning electron microscopy. Prerequisites: BioS 222 and 426.

**429. Laboratory in Electron Microscopy. 3 Hours.**

Animals used in instruction. S/U grade only. Laboratory instruction in cell preparation and instrument operation in transmission and scanning electron microscopy. Prerequisite: Consent of the instructor.

**430. Evolution. 4 Hours.** Mechanisms of genetic and phenotypic stability and change in populations and species; modes of speciation and



macroevolution; trends in evolution. Lecture and discussion.  
Prerequisite: BioS 220.

**431. Plant and Animal Interactions. 3 Hours.** Ecology of nonsymbiotic relationships of plants and animals, including protection mutualisms, pollination, seed dispersal, animal herbivory and plant defense. Prerequisites: BioS 100 and 101, or the equivalent; and any 200- or 300-level BioS course.

**432. Restoration Ecology. 3 Hours.** Philosophical, historical, and ecological basis for ecological restoration, with emphasis on readings in the primary literature and writing. Prerequisite: BioS 330 or the equivalent.

**434. Population Biology. 4 Hours.** Evolution, ecology, genetics, and geography of populations: role of genetic and phenotypic variation in the regulation of population numbers and evolutionary potential and on the analysis of population data. Prerequisite: BioS 220 and Math 180.

**435. Population Biology Laboratory. 2 Hours.** Analysis and interpretation of population and gene dynamics in laboratory populations, field populations and computer simulations. Participation in one or more weekend field trips required. Prerequisite: BioS 330; or credit or concurrent registration in BioS 434.

**436. Biological Conservation. 3 Hours.** Applied ecology of the sustained use of natural resources; emphasis on biological diversity, pollution, population increase, multiple-use concept, and land ethics. Lecture, discussion, and term paper. Prerequisite: Credit or concurrent registration in BioS 330 and 331, or consent of the instructor.

**438. Conservation of Tropical Biodiversity. 3 Hours.** Diverse set of conceptual and practical topics, with emphasis on island biogeographical models, extinction patterns, reserve management, environmental economics, and socio-political aspects of conservation. Prerequisite: BioS 330 or the equivalent.

**439. Field Problems in Biology. 1 to 3 Hours.** May be taken either between semesters (registration during preceding semester) or for a full semester. Credit is given on completion of a satisfactory written report. Field research in natural habitats. Prerequisites: Field experience in a previous biological sciences course and consent of the instructor.

**440. Plant Physiology. 2 Hours.** Structure and function of the plant cell; emphasis on membrane function, water relations, solute absorption and translocation, and photosynthesis. Prerequisites: BioS 100 and 101, or the equivalent; and BioS 222 or 244.

**441. Plant Physiology Laboratory. 2 Hours.** Laboratory experiments and techniques in plant physiology. Prerequisite: Credit or concurrent registration in BioS 440.

**442. Nerve and Muscle Physiology. 4 Hours.** Function of excitable cells in neural, muscular, and cardiovascular tissues will be studied at both cellular and system levels. Prerequisite: Two years of biological sciences.

**443. Animal Physiological Systems. 4 Hours.** Animals used in instruction. Basic function of renal, respiratory, and digestive systems. Integrative role of endocrine systems. Prerequisites: Two years of biological sciences. Credit in BioS 442 is recommended.

**444. Plant Growth and Development. 2 Hours.** Physiology of plant growth and development; phytohormones, differential growth, photomorphogenesis, photoperiodism and flowering, growth suspension and resumption. Prerequisites: BioS 100 and 101, or the equivalent, and BioS 244 or 263 or 420.

**445. Plant Growth and Development Laboratory. 2 Hours.** Laboratory experiments and techniques in plant growth and development. Prerequisite: Credit or concurrent registration in BioS 444.

**448. Environmental Toxicology. 3 Hours.** Sources of environmental pollution and their ecological and health effects. Prerequisites: BioS 100 and 101, or 110, and one physiology course, and credit or concurrent registration in Chem 232.

**450. Advanced Microbiology. 3 Hours.** Comprehensive analysis of metabolic, ecological, phylogenetic, and cytological diversity among the major groups of eubacteria and archaeobacteria. Prerequisites: BioS 350; credit in BioS 456 is strongly recommended.

**452. Biochemistry I. 4 Hours.** Same as Chem 452. Chemistry of proteins, nucleic acids, carbohydrates, and lipids. Prerequisite: Credit or concurrent registration in Chem 234.

**454. Biochemistry II. 4 Hours.** Same as Chem 454. Continues BioS 452. Carbohydrate and lipid metabolism, electron transport. Metabolism of amino acids, nucleic acids, proteins. Biosynthesis of

macromolecules and regulation of macromolecular synthesis. Prerequisite: BioS 452.

**456. Microbial Physiology. 4 Hours.** Prokaryotic cell structure and function; various pathways of energy generation; microbial photosynthesis; microbial genetics; molecular biology of biosynthesis of amino acids, nucleotides, and informational macromolecules. Prerequisite: BioS 350.

**457. General Virology. 4 Hours.** Nature of viruses, their morphology, chemical composition, assay, host-parasite interactions, and life cycles. Prerequisites: BioS 220, and either 222 or 350.

**458. Microbial Biotechnology. 3 Hours.** Production and industrial uses of bacteria, yeasts, mold, and viruses; review of new and established technologies for development of microbial products. Prerequisites: BioS 350; credit in BioS 456 is strongly recommended.

**466. Principles of Paleontology. 4 Hours.** Same as EaEs 466. Theory and methods of evolutionary paleobiology; includes paleoecology, functional morphology, and major features of organic evolution. Prerequisite: BioS 360 or consent of the instructor.

**468. Vertebrate Paleontology. 5 Hours.** Same as Geol 468. Evolution, morphology and paleoecology of the fossil vertebrates. Prerequisites: One year of biological sciences or earth and environmental sciences, and consent of the instructor.

**474. Neural Engineering I. 4 Hours.** Same as BioE 474. Characterization, modeling, and design of neural systems, from channels to networks, within the context of potential and existing applications including neuroprosthetics and hybrid devices. Prerequisites: BioE 340 and BioS 442 or consent of the instructor.

**483. Mammalian Neuroanatomy. 5 Hours.** Animals used in instruction. Structure and function of the mammalian central nervous system. Prerequisite: BioS 225 or 272.

**486. Animal Behavior and Neuroethology. 4 Hours.** Animals used in instruction. Neural and behavioral mechanisms of environmental information processing and interaction throughout the animal kingdom; emphasis on invertebrate and lower vertebrates. Laboratory emphasizing individual research projects with a final report, and occasional field trips required. Prerequisite: One advanced course in zoology and animal physiology.

**487. Developmental Neurobiology. 3 Hours.** Mechanisms contributing to the development of structural and functional components of the nervous system; emphasis on cellular interactions. Prerequisite: BioS 225 or 420.

**488. Developmental Neurogenetics. 3 Hours.** Classical and molecular genetic approaches to the study of the development of the nervous system, concentrating on studies in fruit flies, nematodes and vertebrates. Prerequisites: BioS 220 and either BioS 225 or 420.

**489. Cellular Neurobiology Laboratory. 3 Hours.** Recording from and analyzing the activity of nerve cells, neuronal networks, and other electrically excitable tissues. Prerequisite: BioS 286 or the equivalent.

**490. Topics in Ecology and Evolution. 3 to 4 Hours.** May be repeated for credit. Credit varies according to topic offered. Students may register for more than one section per term. In-depth analysis of advanced topics in ecology and evolution, involving reading primary literature, term paper, student presentations, and critical discussion.

**491. Laboratory in Ecology and Evolution. 0 Hours.** May be repeated. Students may register for more than one section per term. Laboratory component of BioS 490. Prerequisite: Concurrent registration in BioS 490.

**501. Foundations of Biological Thought. 4 Hours.** Analysis of some fundamental concepts in the mainstream of biological thought. Special emphasis on designing instruction that enhances concept acquisition and problem solving.

**502. Patterns of Biological Inquiry. 4 Hours.** Analysis of the influence of concepts, principles, and theories in guiding the design, execution, and interpretation of research. Special emphasis on producing inquiry-based instruction.

**520. Topics in Genetics. 2 Hours.** May be repeated for credit. Students may register for more than one section per term. Discussion of selected topics of current interest in genetics. Prerequisites: BioS 220 and 221 and consent of the instructor.

**524. Molecular Biology I. 5 Hours.** Structural properties and analysis of DNA, RNA, and proteins; principles of cloning and

recombinant DNA technologies; DNA replication, repair, recombination, and transposition. Prerequisite: Consent of the instructor.

**525. Molecular Biology II. 5 Hours.** Gene organization and function in lambda, prokaryotes and eukaryotes; promoters, enhancers, RNA splicing, developmental regulation; protein secretion and targeting. Prerequisite: BioS 524 or consent of the instructor.

**526. Molecular and Genetic Analysis of Development. 3 Hours.** Same as Gene 526. Examines developmental mechanisms used in animal and plant model systems. Lecture. Prerequisite: Graduate standing or consent of the instructor.

**527. Cellular and Systems Neurobiology. 3 Hours.** Same as Anat 527. Molecular and cellular properties of ion channels in neurons and sensory cells and their relationship to brain and sensory systems. Prerequisite: Credit in one neuroscience course or consent of the instructor.

**528. Topics in Molecular Biology. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Credit varies according to topic offered. Selected topics emphasizing molecular studies in such diverse biological areas as virology, microbiology, genetics, photobiology, and immunology.

**530. Population Ecology. 3 Hours.** Life histories, population processes and interactions, and theories of distribution and abundance. Prerequisites: BioS 220, 221, 330, and 331, and consent of the instructor.

**531. Introduction to Ecology and Evolution I. 3 Hours.** Concepts, techniques, and skills needed for research in ecology and evolution. Prerequisite: Consent of the instructor.

**532. Introduction to Ecology and Evolution II. 3 Hours.** Evolutionary and physiological research. Prerequisite: Consent of the instructor.

**533. Functional Ecology of Plants and Animals. 3 Hours.** Some community attributes can be explained by morphological, behavioral, physiological, developmental, and genetic responses of individuals and populations to rigor, variability, and predictability of environments. Prerequisites: One course in general ecology, preferably with field trips (such as BioS 330, 331) or consent of the instructor.

**535. Ecosystems. 3 Hours.** Flow of energy and nutrients in aquatic and terrestrial environments. Prerequisite: BioS 330.

**539. Seminar in Ecology and Evolution. 0 to 1 Hours.** May be repeated for credit. S/U grade only. Graduate student and faculty seminars on selected topics in ecology and evolution. Credit is given only upon completion of a seminar presentation.

**548. Biochemical Toxicology of Environmental Chemicals. 2 Hours.** Biochemical mechanisms responsible for the toxic action and detoxification of environmental toxic chemicals in living organisms. Prerequisite: BioS 448 or a course in pharmacology/pharmacodynamics and pharmacokinetics.

**556. Plant Biochemistry. 1 Hour.** Biochemistry peculiar to plants, including photosynthetic carbon metabolism and electron transport, polysaccharide chemistry, N, S, polysaccharide, and amino acid metabolism, and alkaloids. Prerequisite: BioS 454.

**559. Special Topics in Biochemistry. 3 to 4 Hours.** Same as Chem 559. May be repeated for credit. Students may register for more than one section per term. Selected topics of current interest in biochemistry. Prerequisite: BioS 454 or consent of the instructor.

**560. Topics in Paleontology. 3 to 4 Hours.** Same as EaEs 560. May be repeated for credit if topic is different for each registration. In-depth analysis of current problems and issues in paleontology, involving reading primary literature, student presentations, and critical discussions. Prerequisite: Consent of the instructor.

**580. Themes in Neuroscience. 2 Hours.** Same as Neus 580. May be repeated for credit. Survey of two or three topics in neuroscience with an emphasis on recent research advances. Research that spans the areas under consideration will be emphasized.

**582. Methods in Modern Neuroscience. 2 Hours.** Animals used in instruction. Same as Neus 582. Underlying principles and applications of techniques used to analyze nervous system organization and function. Behavioral, electrophysiological, anatomical, and biochemical approaches are considered.

**583. Practicum in Neuroscience Methods. 3 Hours.** Same as Neus 583. Technologically intense laboratory experience in the methods used by neuroscientists to solve research problems.

Demonstrations and discussions complement laboratory exercises. Prerequisite: BioS 582.

**586. Cell and Molecular Neurobiology. 3 Hours.** Same as Anat 586. Structure and function of voltage-dependent and neurotransmitter-gated ion channels; the role of these ion channels in synaptic transmission, synaptic modification, and neuromodulation. Prerequisite: BioS 442 or consent of the instructor.

**587. Topics in Neurobiology. 1 to 2 Hours.** May be repeated for credit. Students may register for more than one section per term. Credit varies according to the topic offered. In-depth analysis of advanced topics in neurobiology, involving reading primary literature, student presentations, and critical discussion.

**592. Research Seminar. 1 to 2 Hours.** May be repeated for credit. S/U grade only. Presentation of student research with an emphasis on problem-solving and theoretical implications. Prerequisite: Consent of the instructor.

**593. Introduction to Laboratory Research. 2 to 6 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. A hands-on, in-depth introduction to selected research topics and laboratory techniques designed for the beginning graduate student. Prerequisite: Consent of the instructor.

**594. Special Topics in Biological Sciences. 1 to 2 Hours.** Credit varies according to the seminar offered. May be repeated for credit. Students may register for more than one section per term. Selected aspects in biological sciences.

**595. Departmental Seminar. 0 Hours.** S/U grade only. Weekly seminar by staff and invited speakers. Required of graduate students every semester.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Not to be used for MS project or MS/PhD thesis research. Individualized research projects of limited scope. Prerequisite: Consent of the instructor.

**597. Project Research. 2 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. Not to be used for thesis research. S/U grade only. Guided research projects on selected topics in specific fields of advanced modern biology. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research in specialized projects under the direction of a faculty member with appropriate graduate standing, leading to completion of the master's thesis. Prerequisite: Consent of the instructor.

**599. Doctoral Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research on specialized topics under the direction of a faculty member with appropriate graduate standing, leading to completion of the PhD thesis. Prerequisite: Consent of the instructor.

## Biomedical and Health Information Sciences (BHIS)

**405. Medical Sciences and Human Pathophysiology. 3 to 4 Hours.** No credit given if the student has credit in AHS 420 or HIM 313 or HIM 314. Pathophysiological processes in human diseases and specific disease processes of human organ systems. Medical management of persons with disease and pharmacology related to the disease. Medical terminology. Students who require a medical terminology component register for 4 hours and participate in both laboratory and lecture-discussion; all others register for 3 hours and attend lecture-discussion only.

**410. Health Data Structures and Management. 3 Hours.** Data structures in clinical information systems, including database design and management, networking and security. Emphasis on "intrapreneurial" skills required to solve organizational information management problems. Prerequisites: BHIS 400 and BHIS 480.

**420. Biotechnology for Laboratory Sciences. 2 to 3 Hours.** A course designed to provide information about good laboratory practices and general laboratory skills for a wide variety of students interested in laboratory methods which may include research, industry, and medical laboratory science.

**433. Principles of Evidence-Based Health Care. 2 Hours.** Same as MHPE 433. Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, comparing

scientific papers as bases for health care education and practice. Prerequisite: Graduate or professional standing; and approval of the Department.

**437. Health Care Data. 3 Hours.** Same as HPA 437. Review of fundamentals constituting a health care information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems.

**460. Introduction to Health Informatics. 1 Hour.** Same as Phar 460. No credit is given if the student has credit in BHIS 400 or NuSc 218 or IPHS 420. Introduction to information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; storage, retrieval, and networking; system security. Taught on-line with some essential classroom lectures. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisite: Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers.

**461. Information Systems for Health Information Management. 2 Hours.** No credit given if the student has credit in BHIS 400. Advanced topics in information technology and systems in a health care setting; collection, analysis, and management of health care data; special issues related to the role of health information administrators. Extensive computer use required. Prerequisites: IDS 100 and credit or concurrent registration in BHIS 460.

**480. Management and Business Practices. 3 Hours.** Principles of management with emphasis on business functions, procedures, and organizational structure as applied to various health care settings including private and institutional practice. Prerequisite: Graduate standing in the School of Biomedical and Health Information Sciences or consent of the instructor.

**495. Seminar in Biomedical and Health Information Sciences. 1 Hour.** May be repeated for credit. S/U grade only. Specific topics are announced each term. Subjects of current interest presented through lectures and journal review.

**500. Health Informatics Research Methods. 3 Hours.** Review of analytic research methods and knowledge discovery techniques critical to the understanding, development and use of information and implementation of information technology. Prerequisite: Credit or concurrent registration in an introductory course in statistics

**501. Statistics for Health Informatics. 3 Hours.** Builds on participants' existing knowledge of descriptive statistics and fundamental inferential statistics for application in the field of health informatics. Emphasizes qualitative methods. Prerequisite: One introductory course in statistics (e.g., Bstt 400 or the equivalent).

**505. Legal and Social Issues in Health Informatics. 3 Hours.** Examination of the legal and ethical issues involved in computerized health information systems.

**510. Health Care Information Systems I. 4 Hours.** Same as HPA 510. Examination, through case studies, of current information technologies and systems currently in place and on the horizon, in health care organizations and in health science libraries. Prerequisite: Consent of the instructor.

**511. Health Care Information Systems II. 3 Hours.** Experience with health care applications using current information technology and systems in place in health care organizations. Prerequisite: BHIS 510 or consent of the instructor.

**515. Management of Health Care Communication Systems. 4 Hours.** Same as HPA 520. Examination and management of data communications in and between health care facilities including examination of issues, standards, technologies, and system configurations. Prerequisite: BHIS 510 or consent of the instructor.

**520. Health Information Systems Analysis and Design. 4 Hours.** Same as HPA 531. A project course applying systems analysis and design theory to health care systems evaluation, modeling, and implementation. Prerequisite: BHIS 510 or consent of the instructor.

**525. Applications in Health Informatics. 4 Hours.** Same as HPA 540. Covers the application of theory through case study analysis, and the use of information systems for quality assurance and management. Prerequisites: BHIS 510; and BHIS 515 or BHIS 520 or BHIS 530; or consent of the instructor.

**526. Quality Management in Health Care. 3 Hours.** Examination of processes, internal and external to an organization, used

to measure, evaluate, and improve the quality, efficiency, and effectiveness of health care.

**530. Topics in Health Informatics. 4 Hours.** Same as HPA 550. The study of advanced topics in various areas of health informatics. Prerequisites: BHIS 510; and BHIS 515 or BHIS 520 or BHIS 525; or consent of the instructor.

**558. Principles and Methods in Clinical Cytogenetics. 3 Hours.** Introduction to cytogenetics methods including cell culture techniques. Chromosome analysis of various genetic and oncologic diseases. Laboratory experiments using human blood and tissue. Prerequisite: One course in genetics or consent of the instructor.

**559. Clinical Cytogenetics. 3 Hours.** Biological theory and clinical implication of chromosome abnormalities such as trisomy, translocation, duplication, insertion, deletion, and complex arrangements plus actual clinical case studies. Prerequisite: One course in genetics or consent of the instructor.

**580. Practicum in Biomedical and Health Information Sciences. 3 to 12 Hours.** May be repeated for credit. Field experience under supervision of a professional expert in a biomedical and health information sciences setting that is consistent with the student's area of study and career goals. Prerequisite: Consent of the instructor.

**594. Special Topics in Biomedical and Health Information Sciences. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Current theories and methods in biomedical and health information sciences. Seminar, literature search, directed study, and discussion format. Prerequisite: Consent of the instructor.

**595. Seminar in Health Informatics. 1 Hour.** May be repeated for credit. S/U grade only. Topics of current interest in health informatics. Includes discussion of current journal articles and new developments in the field. Prerequisites: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

**597. Project Research in Biomedical and Health Information Sciences. 0 to 5 Hours.** May be repeated for credit. Satisfactory/Unsatisfactory grade only. Independent investigation which engenders the responsibilities of professionals to contribute to their field. Students investigate a topic/problem in their field, write an article and deliver an oral presentation. Prerequisite: Consent of the instructor.

**598. Research in Biomedical and Health Information Sciences. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. Satisfactory/Unsatisfactory grade only. Independent research in one area of biomedical and health information sciences directed by a faculty member. Prerequisites: Foundation courses in research and statistics, or consent of the instructor.

## Biomedical Visualization (BVis)

**400. Visual Cognition. 2 Hours.** Introductory survey of visual information processing including perception, processing models, higher processes, memory and the impact of technology on visualization.

**405. Anatomical Visualization. 3 Hours.** Graphic manipulation and representation of human morphology and gross anatomy. Graphic construction skills, visual standards and conventions, data collection methods, and personal sketch style development. Prerequisite: Consent of the instructor.

**410. Photo Application I. 2 Hours.** Photography as a practical tool for the scientific illustrator. Stat camera, flat-copy functions, photographic note-taking, and editorial problem-solving imagery. Includes line, tone, and full-color processes. Prerequisite: Consent of the instructor.

**415. Computer Applications. 2 Hours.** Using the internet as a communication tool with emphasis on the World Wide Web: FTP, Telnet, HTML authoring, image processing, navigation and interface design. Prerequisite: Consent of the instructor.

**420. Illustration Techniques. 3 Hours.** Introduction to line, continuous tone and color rendering techniques. Digital image creation and manipulation, color theory and design, print and electronic publication issues. Prerequisite: BVis 405 or consent of the instructor.



**430. Surgical Orientation. 1 Hour.** Survey of surgical specialties, including an historical survey and relationship to visual communication. Instruments, aseptic technique, incisions, suturing, principles of wound healing, imaging modalities, and surgical terminology. Prerequisites: BVis 405 and consent of the instructor.

**440. Instructional Design. 2 Hours.** Instructional design process for print and audiovisual media development in the health sciences. Emphasis on theory in communication, learning, and the instructional design process. Prerequisite: Consent of the instructor.

**450. Graphic Design. 2 Hours.** Fundamentals of graphic design techniques and imagery production as applied to health science print media. Prerequisite: One year of basic design courses.

**460. 3-D Model Design. 2 Hours.** Introduction to the biocommunicator's role in 3-D models, anatomical simulators, prosthetics, health care exhibits. Exploration of materials and techniques for impression taking, sculpting, mold construction, and casting.

**480. Business Practices. 2 Hours.** Business procedures and organizational structures associated with the role of a biocommunicator in institutional, freelance, and small business settings. Topics range from business forms and procedures to legal and ethical issues. Prerequisite: Consent of the instructor.

**500. Biomedical Imaging I. 3 Hours.** Methodologies for imaging biological structures at microscopic and macroscopic scales. Human anatomy and histology concepts and terminology are presented in relation to imaging methods. Prerequisite: Consent of the instructor.

**501. Biomedical Imaging II. 3 Hours.** Continuation of BVis 500. Technical aspects of image processing, analysis, compression, 3-D reconstruction and evaluation are stressed. Prerequisite: BVis 500.

**505. Computer-Based Morphometrics. 2 Hours.** Biological form measurement and comparison. Concepts of descriptive and inferential statistics applied to problems of measurement and quantification of the biological form. Prerequisite: Consent of the instructor.

**515. Advanced Graphic Design. 3 Hours.** Application of graphic design techniques to a simulated, multicomponent client project. Exploration of conceptualizing techniques and project management. Prerequisite: BVis 450.

**520. Advanced Illustration Techniques. 3 Hours.** Instruction in advanced line and color rendering techniques. Medical illustration methods for patient education, editorial and product, and diagnostic image interpretation. Print and electronic publication issues. Prerequisite: BVis 420.

**525. Illustration Applications. 4 Hours.** Production experiences in selected biomedical communications specialties: electronic print media, multimedia, animation, web site design, etc. Guest instructors with special expertise are utilized wherever feasible. Prerequisite: BVis 420.

**530. Surgical Illustration. 4 Hours.** Students attend surgery, research surgical procedures and prepare illustrations for educational and commercial use. Students integrate knowledge of instructional design, anatomy, graphic design, and illustration techniques. Prerequisites: Anat 441 and BVis 420, 430, 440, and 450.

**540. Computer Visualization. 4 Hours.** Construction of three-dimensional computer models of biological and anatomical structures using software modelers, 3-D input devices and medical scans and data. Prerequisite: BVis 415.

**542. Computer Animation. 4 Hours.** Investigates principles of motion using computer animation techniques to solve contemporary problems in medical education and communication where motion can effectively be used. Production from concept to final presentation. Prerequisites: BVis 415 and 540 and consent of the instructor.

**545. Computer-Based Multimedia. 4 Hours.** An introduction to the use of desktop multimedia development systems. Software options for creating, manipulating, animating and combining graphics, text, video, and sound for presentation and electronic publication. Prerequisites: BVis 415 and 440.

**550. Simulators and Models. 2 Hours.** An extension of the principles learned in BVis 460. Emphasis on materials research and problem-solving strategies for complex 3-D projects. Prerequisite: BVis 460.

**554. Anaplastology Materials and Techniques. 2 Hours.** Hands-on experience with prosthetic materials and techniques. Emphasis on health and safety issues related to laboratory equipment

and clinical procedures. Prerequisites: AHS 420 and Anat 441 and BVis 460.

**555. Clinical Anaplastology. 4 Hours.** Concepts of prosthetic rehabilitation. Provision of facial/somato prosthetic services in a multidisciplinary clinical setting requiring direct interaction with patients with disfigurements. Emphasis on prosthetic techniques and materials. Prerequisite: Anat 441, AHS 420, and BVis 460, or consent of the instructor.

**580. Practicum in Biomedical Visualization. 6 to 12 Hours.** Field experience under supervision of a professional expert in a biomedical communication setting that is consistent with student's area of concentration and career goals. Prerequisite: Consent of the instructor.

**594. Special Topics in Biomedical Visualization. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Selected topics in specialty areas of biomedical visualization, depending on sufficient student demand and faculty availability, e.g., pharmaceutical illustration, ocular prosthetic design, etc. Prerequisite: Consent of the instructor.

**595. Seminar in Biomedical Visualization. 1 Hour.** May be repeated for credit. S/U grade only. Topics of current interest in biomedical visualization. Includes discussion of current journal articles and important new developments in the field. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. For students who wish to pursue independent study not related to their project research. Prerequisite: Consent of the instructor.

**597. Project Research. 0 to 5 Hours.** May be repeated for credit. S/U grade only. Independent investigation which engenders the responsibilities of professionals to contribute to their field. Students investigate a topic/problem in their field, write an article, and deliver an oral presentation. Prerequisite: Consent of the instructor.

**598. Research in Biomedical Visualization. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research in biomedical visualization directed by a faculty member. Prerequisite: Foundation courses in research and statistics, or consent of the instructor.

## Biopharmaceutical Sciences (BpS)

Note: Courses listed under this rubric were previously listed under Pharmacodynamics (PmPd) and Pharmaceutics (PmPc).

**423. Adverse Drug Reactions. 2 Hours.** Previously listed as PmPd 423. Attention focused on the epidemiology and characterization of adverse reactions. Factors which interplay in adverse reactions to medications are discussed. Reactions characterized in relation to organ systems. Prerequisites: Phar 403 and Phar 404; or consent of the instructor.

**470. Clinical Pharmacology I. 1 Hour.** Previously listed as PmPd 470. Basic principles of clinical pharmacology/toxicology including clinical trial design, statistical interpretation, pharmacokinetics, drug interactions (side effects), as well as basic mechanisms involved in the above.

**471. Clinical Pharmacology II. 1 Hour.** Previously listed as PmPd 471. Basic principles of clinical pharmacology applied to critical analysis of patient case histories in major disease states and FDA requirements. Prerequisite: BpS 470.

**480. Application of Science to the Law. 4 Hours.** Previously listed as PmPd 480. Same as CrJ 480. Issues affecting the development, accessibility and admissibility of forensic science services by the criminal justice system; problems which may compromise the quality, fairness and effectiveness of scientific inquiries. Prerequisites: CrJ 210 and 260 or graduate standing.

**501. Biopharmaceutical Sciences I. 4 Hours.** First part of the fundamental didactic core course in biopharmaceutical sciences including fundamental principles of pharmaceutics, pharmacokinetics, scientific ethics and research design. Prerequisite: Graduate standing in the Biopharmaceutical Sciences program or approval of the department.

**502. Biopharmaceutical Sciences II. 4 Hours.** Second part of fundamental didactic core courses in biopharmaceutical sciences; fundamental principles of cell and molecular biology and pharmacogenomics, pharmacodynamics including toxicology, research communication and regulatory processes. Prerequisites: BpS 501 and graduate standing in the Biopharmaceutical Sciences program or approval of the department.



**503. Laboratory Techniques in Biopharmaceutical Sciences. 3 Hours.** No credit given if the student has credit in PmPd 500. Laboratory-based core course in methods and techniques employed in biopharmaceutical sciences research. Prerequisite: BpS 502 or consent of the instructor.

**506. Industrial Experience. 4 to 10 Hours.** Previously listed as PmPc 506. S/U grade only. Recommended to graduate students with no industrial experience. Students spend time working in the pharmaceutical, imaging or cosmetic industry under academic supervision to obtain practical experience. Prerequisites: BpS 501 and 502 and 503 and 510 and 515; and Bstt 400; and GC 401 and 470 and 471; and Bche 460.

**510. Principles of Interfacial Phenomena. 3 Hours.** Previously listed as PmPc 510. Quantitative and theoretical principles of physical and chemical sciences as applied to pharmacy. Thermodynamics, kinetics, colloid and surface chemistry in evaluation of pharmaceutical formulations. Prerequisites: Math 480.

**515. Dissolution and Bioavailability of Dosage Forms. 2 Hours.** Previously listed as PmPc 525. Theories and testing of the release of drug from solid dosage forms including the effect of dissolution rate on bioavailability. Prerequisites: Phar 323 and approval of the department.

**519. Percutaneous Drug Delivery. 2 Hours.** Previously listed as PmPc 576. Modern methods of drug delivery covering the use of enhancers, prodrugs, iontophoresis, and ultrasound are presented. Toxicity testing, regulatory issues for successful marketing and production issues. Prerequisite: Consent of the instructor.

**520. Lipid-Based Drug Delivery Systems. 2 Hours.** Previously listed as PmPc 580. The preparation, characterization, stability, pharmaceutical cosmetic and diagnostic applications of lipid-based drug delivery systems including liposomes, micelles and emulsions prepared with phospholipids. Prerequisites: Phar 323 and approval of the department.

**540. Topics in Adverse Drug Reactions. 2 Hours.** Previously listed as PmPd 520. Advanced treatment of current adverse drug reaction incidents, involving evaluation of the issues. Prerequisite: Consent of the instructor.

**542. Pharmacodynamics of Substance Abuse. 2 Hours.** Previously listed as PmPd 523. Considers the mechanisms of action, responses, pharmacokinetics and dependence factors of substance abuse. Emphasis will be placed on research strategies in studying the biological aspects of drug abuse. Prerequisites: Consent of the instructor and a course in basic pharmacology.

**543. Psychoneuroimmunology. 2 Hours.** Previously listed as PmPd 525. The interactions between the immune system, the endocrine system and the central nervous system specifically as they relate to stress and immunity.

**544. Immunotoxicology. 2 Hours.** Previously listed as PmPd 562. Basic mechanisms of toxicologic responses to drugs and chemicals due to immediate and delayed hypersensitivity reactions. Emphasis on laboratory methods used in the study of immunotoxicology. Prerequisite: Consent of the instructor.

**545. Advanced Pharmacokinetics. 3 Hours.** Previously listed as PmPd 542. Kinetics of absorption, distribution, metabolism, and excretion of drugs. Factors affecting these kinetics and their relationship to pharmacodynamics will be discussed. Prerequisite: Consent of the instructor.

**546. Computer Techniques in Pharmacokinetics. 3 Hours.** Previously listed as PmPd 541. Computer applications in pharmacokinetics and pharmacodynamics. Principles necessary for understanding the uses, advantages and limitations of computer methods are discussed. Prerequisite: BpS 545 or consent of the instructor.

**551. Pharmacological Basis of Therapeutics I. 2 Hours.** Pharmacological basis of drugs for the treatment of diseases, including cancer, and conditions, including inflammation, of the nervous and gastrointestinal systems. Prerequisites: Credit or concurrent registration in Bche 460 and BpS 502; or approval of the department.

**552. Pharmacological Basis of Therapeutics II. 2 Hours.** Pharmacological basis of drugs for treatment of diseases, including cancer, and conditions, including inflammation, of the cardiovascular, renal and endocrine systems. Prerequisite: BpS 551; or approval of the department.

**555. Pharmacogenomics and Toxicology. 1 Hour.** Modern approaches to understanding the molecular basis of individual

differences to drug response, including toxicity. Prerequisites: BpS 502 and Bche 460 and Gene 502; or approval of the department.

**580. Forensic Science: Survey and Foundations. 2 Hours.** Previously listed as PmPd 580. Same as CrJ 580. Survey course for forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, pattern evidence. Prerequisite: Approval of the department.

**581. Forensic Analysis of Biological Evidence. 4 Hours.** Previously listed as PmPd 581. Same as CrJ 581 and MLS 581. Forensic blood and physiological fluid identification; DNA typing of biological evidence; report writing; expert testimony. Prerequisite: Consent of the instructor.

**582. Forensic Chemistry and Trace Evidence Analysis. 4 Hours.** Previously listed as PmPd 582. Same as CrJ 582. Trace evidence: hairs, fibers, glass, soil, paint and miscellaneous; nature, chemical, instrumental, microscopical methods of analysis; interpretation and significance of trace similarities; expert testimony. Prerequisite: Consent of the director of graduate studies.

**583. Physical Pattern Evidence Analysis. 4 Hours.** Previously listed as PmPd 583. Same as CrJ 583. Pattern evidence: individualization, reconstruction; fingerprint classification; questioned documents; handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction will be studied in depth. Prerequisites: Consent of the instructor.

**584. Forensic Drug Analysis and Toxicology. 4 Hours.** Previously listed as PmPd 584. Same as MLS 584 and CrJ 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media, with emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the instructor.

**586. Topics in Specialty Forensic Examinations. 1 to 4 Hours.** Previously listed as PmPd 594. May be repeated for credit if topic is different for each registration. Students may register for more than one section per term. Topics may vary but will revolve around specialty forensic examinations, covering specific evidentiary classes (e.g. drug identification, DNA typing, fingerprints), including forensic laboratory methods, approaches and data interpretation. Prerequisites: BpS 581 or 582 or 583 or 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

**588. Expert Witness Testimony and Courtroom Demeanor. 3 Hours.** Trials, hearings, grand jury; expert versus lay witness; personal and behavioral characteristics on the stand; results, reports and courtroom testimony; simulated trial testimony. Prerequisite: Approval of the department.

**589. Special Topics in Forensic Science. 3 Hours.** Previously listed as PmPd 589. May be repeated for credit if topic is different for each registration. Same as CrJ 589. Content may vary but will revolve around the philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to noncriminalistics fields. Prerequisite: Consent of the instructor.

**590. Forensic Science Residency. 3 Hours.** Previously listed as PmPd 590. May be repeated for a maximum of 12 hours of credit. S/U grade only. In-depth training for casework analysis in a specific forensic discipline (e.g. drug identification, DNA typing, fingerprints) in an approved forensic science laboratory. Prerequisites: BpS 581 or 582 or 583 or 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

**591. Topics in Forensic Microscopy. 1 to 4 Hours.** Previously listed as PmPd 591. May be repeated for credit if topic is different for each registration. Students may register for more than one section per term. Topic may vary but will revolve around microscopical characterization of various materials, with emphasis on forensic laboratory methods and approaches, and interpretation of materials comparisons as evidence. Prerequisites: BpS 582; and consent of the instructor.

**592. Forensic Science Internship. 2 to 4 Hours.** Previously listed as PmPd 592. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Placement in a forensic science or toxicology laboratory or setting, under the supervision of a faculty member, with an accepted research project or paper required. Prerequisites: BpS 580; and consent of the instructor; and a minimum of 15 hours of credit earned in the MS in forensic science program.

**593. Research in Biopharmaceutical Sciences. 0 to 16 Hours.** Previously listed as PmPc 593 and PmPd 593. May be repeated for credit. S/U grade only. Research in biopharmaceutical sciences with the guidance of a faculty mentor. Prerequisite: Approval of the department.

**594. Special Topics Biopharmaceutical Sciences. 1 to 4 Hours.** May be repeated for a maximum of 4 hours of credit if topic is different for each registration. Content varies. Special topics in biopharmaceutical sciences not covered in regular core or elective offerings. Prerequisite: Consent of the instructor.

**595. Departmental Seminar. 1 to 2 Hours.** Previously listed as PmPc 595 and PmPd 595. May be repeated for credit. S/U grade only. Departmental seminar for research and experimental techniques in the biopharmaceutical sciences. Prerequisite: Approval of the department.

**596. Independent Study in Forensic Science. 1 to 8 Hours.** Previously listed as PmPd 596. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Supervised projects may consist of extensive reading or laboratory work, or both, on topics not covered in regular course offerings. Research undertaken for this course may not duplicate that being done for BpS 597 or 598. Prerequisite: Consent of the instructor.

**597. Forensic Science Project Research. 3 Hours.** Previously listed as PmPd 597. S/U grade only. Supervised research in forensic science; a research project to be designed and completed within one semester. Prerequisites: BpS 580; and consent of the instructor and at least the core course in the MS in Forensic Science program covering the subject area in which the research is to be conducted.

**598. MS Thesis Research. 0 to 16 Hours.** Previously listed as PmPc 598 and PmPd 598. May be repeated for a maximum of 10 hours of credit. A minimum of 6 hours is required. S/U grade only. For students doing MS thesis research or thesis writing. Prerequisite: Consent of the instructor.

**599. Dissertation Research. 0 to 16 Hours.** Previously listed as PmPc 599 and PmPd 599. S/U grade only. May be repeated for credit. PhD thesis research. Prerequisite: Consent of the instructor.

## Biostatistics (Bstt)

**400. Biostatistics I. 3 Hours.** Descriptive statistics, basic probability concepts, one- and two-sample statistical inference, analysis of variance, and simple linear regression. Introduction to a statistical computer package such as Minitab or SAS. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

**401. Biostatistics II. 4 Hours.** Simple and multiple linear regression, stepwise regression, multifactor analysis of variance and covariance, non-parametric methods, logistic regression, analysis of categorical data; extensive use of computer software. Prerequisite: Bstt 400.

**402. Logistic Regression and Survival Analysis. 2 Hours.** Interpretation of logistic regression and survival analysis models. Running logistic and proportional hazards regression models and constructing life-tables using SAS. Prerequisite: Bstt 401.

**410. Introduction to Statistical Computing. 1 Hour.** Application of statistical packages for appropriate statistical analysis and interpretation. Students will use computers for homework assignments. Prerequisite: Credit or concurrent registration in Bstt 400.

**430. Design of Clinical Trials. 3 Hours.** Rationale for clinical trials, blinding, ethical issues, methods of randomization, crossover trials, power and sample size calculations, data management, protocol deviation, data analysis, interim analysis. Prerequisites: Bstt 401 or the equivalent, Epid 401, and consent of the instructor.

**440. Sampling and Estimation Methods Applied to Public Health. 3 Hours.** Major sampling designs and estimation procedures used in the conduct of sample surveys with emphasis on topics relevant to the health sciences. Prerequisite: Bstt 401 or 502 or consent of the instructor.

**494. Introductory Special Topics in Biostatistics. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Special topics in biostatistics. Content varies. Prerequisite: Consent of the instructor.

**502. Biostatistics Methods I. 4 Hours.** Foundations for and introduction to statistical inference, including one- and two-sample

problems; regression analysis, including multiple regression and indicator variables. Prerequisites: College calculus, including multivariable calculus, concurrent registration in Bstt 503, and consent of the instructor.

**503. Biostatistics Laboratory. 2 Hours.** Use of spreadsheets for statistical investigations; use of statistical software; matrix theory, including methods relevant in biostatistical analysis. Prerequisites: Concurrent registration in Bstt 502 and consent of the instructor.

**504. Biostatistics Methods II. 4 Hours.** Analysis of variance and multiple comparisons; model building and diagnostics; generalized linear models; logistic and Poisson regression; introduction to repeated measures and mixed models. Prerequisites: Bstt 502 and 503, or consent of the instructor.

**511. Categorical Data Analysis. 3 Hours.** Previously listed as Bstt 550. Contingency tables and their tests, measures of association, stratified analysis, logistic regression, generalized linear model, Poisson regression, log-linear model, matched data, marginal homogeneity, ordinal data. Prerequisites: Bstt 504 and Stat 411 or consent of the instructor.

**512. Survival Analysis. 3 Hours.** Previously listed as Bstt 530. Concepts of lifetime or survival distributions, especially with censored data; nonparametric estimation of the survival function; rank tests; proportional hazards regression models; parametric models. Prerequisite: Bstt 504 and Stat 411 or consent of the instructor.

**513. Longitudinal Data Analysis. 4 Hours.** Application and theory of models for longitudinal data analysis for both continuous and categorical response data, including use of statistical software for these methods. Prerequisites: Stat 411 and Bstt 504, or consent of the instructor.

**514. Biostatistical Consulting. 2 Hours.** Previously listed as Bstt 510. Restricted to students enrolled in the biostatistics major. Discussion of techniques required for successful biostatistical consultation; effective communication, problem formulation, data analysis, oral and written reports, supervised consulting experience. Prerequisites: Bstt 504 and consent of the instructor.

**521. Applied Multivariate Analysis. 3 Hours.** Previously listed as Bstt 580. Analysis of vector of responses; MANOVA, data reduction methods; introduction to cluster analysis, discriminant analysis, and structural equation models. Prerequisites: Bstt 513 and consent of the instructor.

**522. Biostatistical Investigations. 4 Hours.** Analysis of several large data sets that will require integration of numerous biostatistical tools; written summarization and discussion of results. Prerequisites: Bstt 511, 512, 513, 514; and concurrent registration in Bstt 521.

**531. Advanced Statistical Inference. 3 Hours.** An in-depth consideration of some important ideas of statistical inference including large-sample theory, estimation and testing. Specific topics to be covered include asymptotic theory, parameter estimation methods and hypothesis testing. Some computer use in class. Prerequisites: Consent of the instructor. Open only to PhD degree students.

**533. Linear Models. 4 Hours.** Generalized inverse matrices; distributions for quadratic forms; estimability and testable hypotheses; constrained linear model; applications to regression, ANOVA, ANCOVA models; variance component models. Prerequisites: Consent of the instructor. Open only to PhD degree students.

**594. Special Topics in Biostatistics. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced special topics. Content varies. Prerequisites: Bstt 501 and consent of the instructor.

**595. Biostatistics Seminar. 1 to 3 Hours.** S/U grade only. Current developments in theory and application of biostatistics with presentations by students, faculty, and visiting scientists. Prerequisites: Bstt 501 and consent of the instructor.

## Business Administration (BA)

**589. Corporate Business Internship Program. 0 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Satisfactory/Unsatisfactory grade only. Corporate business internship provides graduate students an opportunity to gain practical work experience in their field of study and to test their career choice. Prerequisites: Consent of the director of the Business Career Center. Approval by the director of graduate studies prior to registration is required for students in the MS in accounting and MS in management information systems programs.

**594. Special Topics in Business Administration. 1 to 8 Hours.** May be repeated for a maximum of 16 hours of credit. Students may register for more than one section per term. An intensive study of a selected topic in business administration. Topics vary by section and by term. Prerequisite: Consent of the graduate business program advisor.

## Chemical Engineering (ChE)

**401. Physical Properties of Fluids. 4 Hours.** Prediction and correlation of the various equilibrium (critical constants, surface tension, virial coefficients etc.) and nonequilibrium (transport coefficients) properties, and kinetic theory. Prerequisite: ChE 301 or consent of the instructor.

**410. Transport Phenomena. 4 Hours.** Continuum theory of momentum, energy, and mass transfer. Viscous behavior of fluids. Laminar and turbulent flow. Thermal conduction and convection, diffusion and coupled operations. Prerequisite: ChE 312 or consent of the instructor.

**411. Fluidization Engineering. 4 Hours.** Fluidization phenomenon. Bubbling bed model, heat and mass transfer, entrainment and elutriation theories. Gas-solid reaction kinetics and combustion. Analytical modeling of fluid beds. Prerequisite: ChE 321 or consent of the instructor.

**412. Fluid-Particle Processes. 4 Hours.** Characterization of particles. Particle-fluid mechanics in single and multiple particle systems. Hydrodynamic and nonhydrodynamic forces. Stability, rheology, and flow behavior of colloidal suspensions. Prerequisite: ChE 410 or consent of the instructor.

**413. Introduction to Flow in Porous Media. 4 Hours.** Theoretical modeling of single-phase and multiphase flow in porous media. Darcy's law and relative permeabilities. Oil production and hydrology. Capillary phenomena. Dispersion and miscible displacement. Prerequisite: ChE 312 or consent of the instructor.

**421. Combustion Engineering. 4 Hours.** Combustion chemistry and thermochemistry. Kinetics and mechanism of combustion; ignition and pollutant formation. Detonation and deflagration; premixed and diffusion flames. Surface reaction and droplet combustion. Applications. Prerequisites: ChE 301 and 321.

**422. Biochemical Engineering. 4 Hours.** Enzyme-catalyzed and microbially-mediated processes. Free and immobilized enzymes. Batch and continuous cell cultures. Transport phenomena in microbial systems and fermentation processes. Design of biological reactors. Prerequisite: Consent of the instructor.

**423. Catalytic Reaction Engineering. 4 Hours.** Catalytic reactions that occur under conditions for which heat and mass transfer cannot be neglected are considered. Includes porosimetry, surface area measurements, and catalyst deactivation. Prerequisite: ChE 321 or consent of the instructor.

**425. Waste Treatment Technologies. 4 Hours.** Characterization and analysis of waste components in gas emissions, liquid and solid streams, and suitability for treatment technologies. Management and remediation of hazardous waste sites. Prerequisite: CEMM 216.

**426. Waste Management Strategies. 4 Hours.** Process strategies for waste minimization. Management of hazardous wastes. Reuse of hazardous waste components. Regulation legislation affecting waste management. Prerequisite: ChE 425 or consent of the instructor.

**431. Numerical Methods in Chemical Engineering. 4 Hours.** Introduction to the application of numerical methods to the solution of complex and often nonlinear mathematical problems in chemical engineering. Includes methods for the solution of problems arising in phase and chemical reaction equilibria, chemical kinetics, and transport.

**440. Non-Newtonian Fluids. 4 Hours.** Fluid mechanics and transport processes involving non-Newtonian fluids. Purely viscous and viscoelastic behavior. Viscometric functions and rheometry. Heat and mass transfer in non-Newtonian fluids. Prerequisite: ChE 410 or consent of the instructor.

**441. Computer Applications in Chemical Engineering. 4 Hours.** Nonnumerical applications of computers: artificial intelligence and expert systems for chemical engineering design and on-line diagnosis; data acquisition and control for digital process control; process design calculations. Prerequisite: Senior standing in chemical engineering.

**445. Mathematical Methods In Chemical Engineering. 4 Hours.** Advanced mathematical techniques in chemical engineering. Includes infinite series in thermodynamic perturbation theory; Laplace transforms in process control; chemical diffusion transport theories and differential equations. Prerequisite: Math 220 or the equivalent.

**450. Air Pollution Engineering. 4 Hours.** Same as ME 450. Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion. Prerequisite: ME 321 or consent of the instructor.

**494. Selected Topics in Chemical Engineering. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Systematic study of selected topics in chemical engineering theory and practice. Prerequisite: Consent of the instructor.

**501. Advanced Thermodynamics. 4 Hours.** Laws of thermodynamics. General conditions for equilibrium and stability. Thermodynamic potentials. Phase transition and critical phenomena. Principle of irreversible thermodynamics, Onsager's fundamental theorem and engineering applications. Prerequisite: Math 220 or the equivalent.

**502. Fluid Phase Equilibria. 4 Hours.** Application molecular theories of fluids to phase equilibrium systems. Intermolecular potentials, partition functions, correlation functions, chemical potentials, fugacity, and activity coefficient and their relationships. Prerequisite: ChE 301 or the equivalent.

**503. Thermodynamics of Multicomponent Mixtures. 4 Hours.** Thermodynamic theories of mixtures. Molecular principles of various solution theories. Conformal solutions, lattice theories, group contribution function theories, and perturbation and variational theories. Prerequisite: ChE 502 or the equivalent.

**505. Advanced Statistical Thermodynamics. 4 Hours.** Development of the principles of statistical mechanics. Calculation of partition functions and properties for the ideal gas including polyatomic gases. Ensemble concepts and interacting subsystems. Applications. Prerequisite: ChE 502.

**510. Separation Processes. 4 Hours.** Advanced coverage of equilibrium stage separation. Multicomponent separation and distillation; unsteady state adsorption processes. Separation efficiencies and energy requirements. Prerequisite: ChE 410.

**511. Advanced Mass Transfer. 4 Hours.** Analysis of diffusion and mass transport in chemical engineering systems. Unsteady state diffusion, convective diffusion, mass transfer coefficient, dispersion, and the study of diffusion and reaction and simultaneous mass transport. Prerequisite: ChE 410.

**512. Microhydrodynamics, Diffusion and Membrane Transport. 4 Hours.** Theoretical and numerical fluid mechanics of microstructure: potential flow and virtual mass, quasistatic versus transient Stokes flow, integral theorems, multipole expansions, singularity solutions, fluctuations, and current applications. Prerequisite: ChE 410 and 445 or consent of the instructor.

**513. Coal Combustion and Gasification. 4 Hours.** Chemical reaction engineering of coal combustion and gasification. Mathematical modeling of coal combustors and gasifiers. Heat transfer in fluidized beds and flue gas cleanup. Prerequisite: ChE 411 or consent of the instructor.

**514. Biotransport. 4 Hours.** Same as Bioe 514. Diffusion and flow in living systems. Blood rheology and flow. Microcirculation, oxygen transport, diffusive transport across membranes. Membrane structure; water, and ion flows, active transport. Prerequisite: ChE 410 or consent of the instructor.

**522. Advanced Biochemical Engineering. 4 Hours.** Cell culture systems: procaryotic, eucaryotic, plant, and insect, design of specialized biological reactors, principles of genetically engineered biological systems, biochemical separation techniques, biochemical engineering applications for waste treatment. Prerequisite: ChE 422.

**524. Characterization Techniques in Catalysis. 4 Hours.** The most common crystallographic, spectroscopic, and physicochemical techniques for characterization of bulk solids, solid surfaces, and gas-solid interactions are surveyed. Prerequisite: Consent of the instructor.

**527. Advanced Chemical Reaction Engineering. 4 Hours.** Multiplicities in chemically reacting systems; nonideal reactors: effects of residence time distribution and mixing history. Heterogeneous noncatalytic reactions: gas-liquid, liquid-liquid, and solid-fluid systems. Heterogeneous catalytic reactions. Prerequisite: ChE 321.



**530. Gas Kinetics. 4 Hours.** Modern theory and experimental methods in the rates of gas reactions. Review of phenomenological kinetics, collision theory, energy transfer, unimolecular reactions, transition state and RRKM theory. Modern applications. Prerequisite: ChE 505.

**590. ProMOTe Seminar I. 0 Hours.** S/U grade only. The development of intercultural communication skills for PhD students in engineering from non-English speaking backgrounds. Prerequisite: Acceptance into a PhD program in engineering

**591. ProMOTe Seminar II. 0 Hours.** S/U grade only. Workshop in U.S. culture and society for PhD students in engineering, from non-English speaking backgrounds. Prerequisite: Acceptance into a PhD program in engineering.

**592. Specialized Problems. 4 to 8 Hours.** Specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

**594. Advanced Topics in Chemical Engineering. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced topics in chemical engineering theory and practice. Subjects vary from year to year. Prerequisite: Consent of the instructor.

**595. Seminar in Chemical Engineering Research. 1 Hour.** Advances in chemical engineering research will be discussed in a seminar setting. Students will be expected to make presentations in areas of: catalysis, thermodynamics, transport phenomena, and kinetics. Prerequisite: Graduate standing in chemical engineering.

**598. MS Thesis Preparation. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research in specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

**599. PhD Thesis Preparation. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research in specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

## Chemistry (Chem)

**414. Inorganic Chemistry I. 4 Hours.** Introduction to the principles of inorganic chemistry. Structural and descriptive chemistry of the main-group elements. Prerequisite: Chem 342 or consent of the instructor.

**415. Inorganic Chemistry Laboratory. 2 Hours.** Advanced inorganic chemistry laboratory. Preparative methods, Schlenk techniques, dry box, Fourier-transform infra-red and UV-visible spectroscopy, crystal growth. Prerequisite: Credit or concurrent registration in Chem 414.

**416. Inorganic Chemistry II. 4 Hours.** Structural and descriptive chemistry of the transition elements. Prerequisite: Chem 414.

**421. Instrumental Analysis. 4 Hours.** A survey of contemporary instrumentation for chemical analysis. Emphasis on fundamentals of instrumental methods with actual experience on typical equipment. Includes two weekly three-hour laboratories. Prerequisites: Chem 222 and credit or concurrent registration in Chem 342.

**422. Applied Electronics for Scientists. 4 Hours.** For scientists with little background in electronics who need working knowledge of electronic devices, circuits, instruments, devices, principles of electronics, analog and digital systems. Includes two weekly laboratories. Prerequisite: Graduate standing in any of the physical sciences or engineering, or consent of the instructor.

**432. Intermediate Organic Chemistry. 3 Hours.** Rigorous treatment of the principles upon which modern organic chemistry is developed. Prerequisites: Chem 235 and 342.

**444. Physical Chemistry III. 3 Hours.** Application of quantum mechanics to molecular spectroscopy, statistical mechanics and activated complex theory. Prerequisite: Chem 346.

**448. Statistical Thermodynamics. 4 Hours.** Introduction to statistical mechanics, partition functions, chemical equilibrium, ensembles, fluctuations, real gases, Einstein and Debye models of solids, magnetic materials, electrolytes, introduction to liquids. Prerequisite: Chem 346.

**452. Biochemistry I. 4 Hours. Same as BioS 452.** Chemistry of proteins, nucleic acids, carbohydrates and lipids. Prerequisite: Credit or concurrent registration in Chem 234.

**454. Biochemistry II. 4 Hours.** Same as BioS 454. Continues Chem 452. Carbohydrate and lipid metabolism, electron transport. Metabolism of amino acids, nucleic acids, proteins. Biosynthesis of macromolecules and regulation of macromolecular synthesis. Prerequisite: Chem 452.

**455. Biochemistry Laboratory. 3 Hours.** Introduction to experimentation with biochemical systems. Includes gas electrophoresis, protein purification, enzyme kinetics, nucleic acid biochemistry, and cloning techniques. Prerequisites: Chem 222 and concurrent registration in Chem 454.

**456. Natural Products. 4 Hours.** Same as BioS 416. Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. Prerequisite: One year of organic chemistry.

**470. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**471. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Chem 470, and approval of the department.

**474. Teaching Chemistry in High Schools. 1 Hour.** May be repeated for credit. S/U grade only. Modern ways to help beginning learners construct in their own minds an understanding of scientific concepts and scientific method. Emphasis on the concepts of chemistry. Prerequisite: Approval of the department.

**488. Cooperative Chemistry Practice. 1 Hour.** May be repeated for credit. S/U grade only. Off-campus participation in a governmental or industrial training program. Credit is contingent on the submission of a final report. Prerequisite: Concurrent registration in LAS 289 or consent of the instructor.

**492. Independent Study. 1 to 2 Hours.** May be repeated for credit. S/U grade only. Individual study under supervision of a faculty member in areas not covered in standard courses. Credit is contingent on the submission of a final report. Prerequisites: Grade point average of 2.50 in science courses and consent of the instructor.

**494. Special Topics in Chemistry. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which the course is given. Prerequisite: Approval of the department.

**499. Supervised Research. 3 Hours.** May be repeated for a maximum of 6 hours of credit. S/U grade only. Individual research performed under supervision of a faculty member. Credit is contingent on the submission of a final report. Research experience is strongly encouraged for career students.

**500. Faculty Research. 1 Hour.** S/U grade only. Mandatory for first year students. Faculty present their research interests to new graduate students.

**510. Literature Seminar in Inorganic Chemistry. 1 Hour.** S/U grade only. Discussion of inorganic research from the current literature. Emphasis on student presentations.

**514. Advanced Inorganic Chemistry I. 4 Hours.** The synthesis, structure, and bonding of selected main group and transition metal species. Describes materials science applications of these compounds. Prerequisite: Chem 416 or the equivalent.

**516. Advanced Inorganic Chemistry II. 4 Hours.** Structural and descriptive chemistry of the transition elements; spectroscopy and magnetism. Prerequisite: Chem 416 or the equivalent.

**518. Advanced Inorganic Chemistry III. 4 Hours.** Synthesis, structure, bonding, and properties of solid-state materials. Prerequisite: Chem 416 or the equivalent or consent of the instructor.

**519. Special Topics in Inorganic Chemistry. 3 to 4 Hours.** May be repeated for credit. Lectures on topics not represented in regularly scheduled courses.



**520. Literature Seminar in Analytical Chemistry. 1 Hour.** S/U grade only. Discussion of analytical chemical research from the current literature. Emphasis upon student presentations.

**522. Techniques in Mass Spectrometry and Surface Analysis. 4 Hours.** Various methods in mass spectrometry. Non-optical applied surface analysis including X-ray photoelectron spectroscopy, Auger spectroscopy, and scanning probe microscopy. Instrumentation, applications and data analysis. Prerequisite: Chem 421 or the equivalent.

**523. Advanced Analytical Chemistry Laboratory. 4 Hours.** Modern qualitative and quantitative analyses employing chromatography, mass-spectrometry, nuclear magnetic resonance, infrared spectroscopy. Development of data acquisition, processing and evaluation algorithms. Includes two three-hour weekly laboratories. Prerequisites: Chem 421 or the equivalent and either Chem 522 or Chem 526.

**524. Optical Spectroscopies in Analytical Chemistry. 4 Hours.** Theory and experimental methods in infrared, ultraviolet and visible spectroscopies, both absorption and emission. Prerequisites: Chem 346 and 421, or consent of the instructor.

**526. NMR Spectroscopy in Analytical Chemistry. 4 Hours.** Principles governing one- and multidimensional nuclear magnetic resonance (NMR) spectroscopy; applications of NMR to chemical analysis. Prerequisite: Chem 421 and 346, or the equivalents, or consent of the instructor.

**528. Chemical Separations. 4 Hours.** Fundamentals and recent advances in techniques and technologies for the separation of chemical substances, including both chromatographic and electrophoretic methods. Special emphasis on trace and microscale methods. Prerequisite: Chem 421 or approval of the department.

**529. Special Topics in Analytical Chemistry. 3 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Lectures and readings in areas not normally treated in standard courses. Discussion of topics of current interest in analytical chemistry. Prerequisite: Consent of the instructor.

**530. Literature Seminar in Organic Chemistry. 1 Hour.** S/U grade only. Discussion of organic chemical research from the current literature. Emphasis upon student presentations. Prerequisite: Consent of the instructor.

**531. Spectroscopic Organic Structure Determination. 3 Hours.** Discussion of principles and modern practice in the elucidation of the structures of organic molecules using NMR, IR, UV, and mass spectrometry. With practical examples. Prerequisite: Chem 234 or the equivalent.

**532. Advanced Organic Chemistry I. 4 Hours.** Chemical bonding, stereochemistry, organic reaction mechanisms, with emphasis on physical principles. Prerequisite: Chem 432 or the equivalent.

**533. Advanced Organic Chemistry II. 4 Hours.** Continues Chem 532. The major reactions in organic chemistry and their uses in synthesis. Prerequisite: Chem 532.

**535. Advanced Synthetic Chemistry. 4 Hours.** Topics include: control of stereochemistry (cyclic + acyclic), synthesis of complex natural and unnatural products (alkaloids, terpenes, and so forth) and new methodologies. Prerequisite: Chem 533.

**536. Physical Organic Chemistry. 4 Hours.** Theoretical and experimental methods of studying reaction mechanisms, with an emphasis on kinetic methods and linear free energy correlations. Prerequisite: Chem 533 or consent of the instructor.

**537. Advanced Practical Preparative Chemistry. 4 Hours.** An intensive practical course in the methods of synthesis, purification and characterization of organic and inorganic compounds. Prerequisite: Graduate standing in chemistry and the approval of the department.

**539. Special Topics in Organic Chemistry. 3 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Discussion of topics of current interest. Prerequisite: Chem 533.

**540. Current Problems in Physical Chemistry. 1 Hour.** S/U grade only. Student seminars presented on varied topics in physical chemistry. Special emphasis on the application of quantum mechanics and statistical mechanics to the solving of problems in molecular structure, dynamics, and spectroscopy.

**542. Quantum Mechanics. 4 Hours.** Exact solutions of the Schroedinger equation for simple systems; variational principle and

perturbation theory; many-electron atoms and diatomic molecules and their electronic structures; angular momentum. Prerequisite: Chem 346 or the equivalent.

**543. Molecular Spectroscopy and Group Theory. 4 Hours.** Group theory and molecular symmetry. Rotations and vibrations of diatomics and polyatomics. Time-dependent quantum mechanics and UV, IR, and NMR spectroscopy. Prerequisite: Chem 542.

**544. Angular Momentum in Quantum Mechanics. 4 Hours.** Quantum-mechanical theory of angular momentum. Application to spectroscopy, reaction dynamics, coupling of angular momenta, rotational transformations, graphical methods, Wigner-Eckart theorem, spherical tensors, rotational spectroscopy. Prerequisite: Chem 542 or consent of the instructor.

**545. Chemical Kinetics. 4 Hours.** Kinetics of elementary chemical reactions; modeling of reaction mechanisms, including collision theory; transition state theory; RRKM theory, and scattering theory; photochemistry, and energy transfer. Prerequisite: Chem 542.

**546. Thermodynamics. 3 Hours.** Thermodynamics. A formal introduction to physical theories of equilibrium thermostatics. Prerequisite: Chem 346 or the equivalent.

**547. The Electronic Structure of Molecules. 3 Hours.** Treatment of electrons in molecular systems. Self-consistent field treatments of electrons in many-electron systems. Configuration interaction and perturbation corrections for electron correlation effects. Prerequisite: Chem 543.

**549. Special Topics in Physical Chemistry. 3 to 4 Hours.** Lectures and readings in areas not normally treated in standard courses. Discussion of topics of current interest in physical chemistry. Prerequisite: Consent of the instructor.

**550. Literature Seminar in Biochemistry. 1 Hour.** S/U grade only. Presentation of student papers on current research topics in biochemistry.

**551. Advanced Biochemistry. 4 Hours.** A survey of biochemistry with special emphasis on the thermodynamics and kinetics of biochemical processes. Prerequisite: Chem 454 and 346, or 344.

**553. Catalysis in Enzymology. 4 Hours.** Applications of physical organic chemistry and steady state kinetics to the understanding of enzyme action. Prerequisite: Chem 454 or consent of the instructor.

**554. Bioinorganic Chemistry. 4 Hours.** Structure, function, and properties of metal ion coordination centers in metalloproteins, as well as the function of metal ions in enzyme activation and membrane transport. Prerequisite: Chem 452 or 415.

**555. Advanced Biochemistry II. 4 Hours.** The structure of nucleic acids and the role and processing of nucleic acids in various aspects of genetic regulation. Prerequisite: Chem 454.

**558. Macromolecular Structure and Dynamics. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Descriptive macromolecular phenomena; translational motions and relation to size and shape; coherent scattering techniques; cooperative transitions; polymer models of nonrigid macromolecules. Prerequisite: Chem 448 or consent of the instructor. Credit in Math 410 is strongly recommended.

**559. Special Topics in Biochemistry. 3 to 4 Hours.** Same as BioS 559. Students may register for more than one section per term. May be repeated for credit. Selected topics of current interest in biochemistry. Prerequisite: Chem 454 or consent of the instructor.

**572. Teaching Methods in Chemistry. 3 Hours.** May be repeated for credit. A maximum of 3 hours may be credited toward departmental course requirements for the MS or PhD. Special problems and techniques, including audiovisual methods, lecture demonstrations, the use of computers, and the design of experiments. Prerequisite: Approval of the department.

**590. Current Problems in Chemical Research. 2 Hours.** May be repeated for credit. S/U grade only. In-depth discussion and analysis of selective aspects of contemporary research with particular emphasis on research carried out in the department. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Prerequisite: Approval of the department.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Prerequisite: Approval of the department.

## Civil and Materials Engineering (CEMM)

### 400. Advanced Design of Reinforced Concrete

**Structures. 4 Hours.** Design of reinforced concrete building structures, including design for lateral loads due to wind, structural systems for reinforced concrete buildings, shear walls, and design for seismic forces. Prerequisite: CEMM 310 or the equivalent.

### 401. Advanced Design of Metal Structures. 4 Hours.

Plate girders; unsymmetrical bending; torsion of thin-walled structures; lateral-torsional instability; composite construction. Prerequisite: CEMM 301.

### 402. Geometric Design of Highway Facilities. 4 Hours.

Elements of geometric design. Driver, vehicle, and roadway system characteristics. Horizontal and vertical alignment design. Intersection design and operation. Safety effects of geometrics. Prerequisite: CEMM 302.

**403. Hydraulic Design. 4 Hours.** Selected applications of hydraulics and hydrology: pipe, pipe network and water distribution system design; unsteady pipe flow; open channel design; storm water engineering. Prerequisite: CEMM 215.

### 404. Urban and Regional Transportation Methods. 4

**Hours.** Same as UPP 461. Methods and models for analyzing and forecasting transportation requirements, costs, and capacities. Prerequisite: Consent of the instructor.

**405. Foundation Analysis and Design. 4 Hours.** Site characterization; analysis and design of shallow foundations, deep foundations and earth retaining structures; foundations on difficult soils; effects on construction; instrumentation and monitoring. Prerequisite: CEMM 315.

**406. Bridge Design. 4 Hours.** Theory and design procedures related to the analysis and design of modern bridges. Using the AASHTO Code, includes concrete and steel structures, construction practices and procedures. Prerequisites: CEMM 301 and 310.

### 407. Soil and Site Improvement Methods. 4 Hours.

Compaction, preloading, vertical drains, grouting, admixture stabilization, thermal stabilization, soil reinforcement, geosynthetics; construction of embankments of soft clay, embankments on mechanically stabilized earth walls, hydraulic barriers; case studies. Prerequisite: CEMM 315.

**409. Structural Analysis II. 4 Hours.** Approximate analysis of structures including trusses and multistory frames. Influence lines, cables and arches. Principles of limit analysis for structures and structural elements. Prerequisite: CEMM 205 or consent of the instructor.

### 410. Design of Prestressed Concrete Structures. 4

**Hours.** Principles of prestressed concrete. Analysis and design of statically determinate prestressed concrete members. Introduction to design and detailing of connections. Prerequisite: CEMM 310.

### 411. Chemistry for Environmental Professionals. 3

**Hours.** Same as EOHS 440. Introductory atmospheric chemistry, aspects of air pollution, chemistry related to natural water and water treatment; priority organic pollutants and heavy metals. Prerequisite: one year of college chemistry.

### 412. Water Quality Management. 3 Hours.

Same as EOHS 411. Water pollution; historical and current developments in problems and solutions: characterization, water purification, waste treatment, modeling, standards and criteria, public health concerns. Prerequisites: EOHS 405 or consent of the instructor.

### 413. Analysis of Water and Wastewater Quality. 2

**Hours.** Same as EOHS 418. Basic instrumentation and procedures related to measurement and surveillance of various water quality parameters.

### 415. Environmental Geotechnology. 4 Hours.

Environmental laws and regulations, sources and types of waste materials, waste materials in geotechnical engineering applications, geotechnical management of municipal, industrial, mine and nuclear wastes. Prerequisite: CEMM 315.

### 419. Air-Quality Management I. 3 Hours.

Same as EOHS 431. Sources, control, dispersion, and effects upon receptors of air pollution: health and other adverse effects, meteorology and dispersion estimation, photochemistry, aerosol characterization. Prerequisite: CEMM 216, or EOHS 405, or consent of the instructor.

### 420. Water and Wastewater Analysis Laboratory. 4

**Hours.** Laboratory class for environmental engineering. Analysis of

water, wastewater and soil for nutrients, pollutants, physical parameters, and biological parameters.

**421. Water Treatment Design. 4 Hours.** Water quality control systems. Physical-chemical unit processes applied to systems designed for treatment of municipal and industrial waters. Field trip required at a nominal fee. Prerequisites: CEMM 216 and consent of the instructor.

### 422. Biological Wastewater Treatment Design. 4

**Hours.** Processes involved in the geological treatment of wastewater. Aerobic and anaerobic treatment, sludge stabilization, and nutrient removal. Field trip required at a nominal fee. Prerequisite: CEMM 216 or the equivalent.

### 423. Management of Solid and Hazardous Wastes. 3

**Hours.** Same as EOHS 472 and Geog 444. Management of solid and hazardous waste, including radioactive waste: landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

### 425. Environmental Remediation Engineering. 4

**Hours.** Sources of contamination, regulations, site characterization, impact assessment, waste disposal and containment options, waste treatment options, case studies. Prerequisite: CEMM 315.

### 429. Introduction to Construction Management. 4

**Hours.** Structure of the construction industry and construction projects; review of arrow and precedence networks. Critical path and PERT networks; consideration of time-cost trade-offs in construction projects; resource allocation analyses.

**430. Theory of Elasticity I. 4 Hours.** The boundary value problems of linear elasticity. Uniqueness of solution. Reduction to two dimensions: the plane problems, torsion, bending. Polar coordinates and general orthogonal coordinates. Prerequisites: CEMM 204 and Math 481 or the equivalents.

### 431. Introduction to Continuum Mechanics. 4 Hours.

Vectors and tensors, stress, principal stresses and principal axes, deformation, compatibility conditions, constitutive equations, isotropy and mechanical properties of fluids and solids. Prerequisites: CEMM 204 and ME 211.

**432. Energy Methods in Mechanics. 4 Hours.** Variational theorems of elasticity. Applications to establish approximate systems and their solution. Beams (including shear deformation) torsion. Introduction to instability theory. Prerequisite: CEMM 205.

### 433. Fracture Mechanics and Failure Analysis I. 4

**Hours.** Classical theory of strength of materials. Fracture mechanisms maps. Continuum damage mechanics. Introduction to fracture mechanics. Singular problems of elasticity. Stress intensity. Energy release rates. Irwin-Orowan, Barenblatt-Dugdale theories. Prerequisite: CEMM 430.

### 434. Finite Element Analysis I. 4 Hours.

Establishment of basic finite element, matrix relations for one-dimensional heat conduction problems: truss, beam, and frame structural systems. Solution methods of the resulting equations. Introduction to two-dimensional analysis. Prerequisites: CEMM 205 or ME 401 and EECs 170.

**435. Theory of Vibrations I. 4 Hours.** Analytical and numerical treatment of linear, discrete systems. Nonlinear discrete systems. Prerequisites: CEMM 200 or the equivalent and Math 220.

### 436. Intermediate Dynamics. 4 Hours.

Same as ME 436. Three dimensional kinematics. Moving reference frames. Euler's angles and equations. Rolling. Stability of motion. Generalized coordinates. Lagrange's form of D'Alembert's principle. Lagrange's equations. Hamilton's principle. Prerequisite: Math 220.

### 450. Probability and Reliability in Structural Design. 4

**Hours.** Maximum uncertainty principle and probability distributions of random variables. Distributions of extremes and their applications. Statistics of failure. The weakest link theory. Time to failure. Structural reliability. Prerequisite: Consent of the instructor.

### 453. Experimental Stress Analysis. 4 Hours.

Strain measurement and dimensional analysis. Strain measurement techniques. Introduction to photoelasticity. Prerequisite: CEMM 430.

### 454. Structural Analysis and Design of Tall Buildings. 4

**Hours.** State-of-the-art introduction to structural analysis and design of tall buildings. Load impact on different structural systems. Prerequisites: CEMM 401 or CEMM 409 or the equivalent, or consent of the instructor.

**460. Crystallography and X-ray Diffraction. 4 Hours.**

Fundamentals of crystallography. Theory of X-ray diffraction, experimental methods and applications. Prerequisite: CEMM 260.

**461. Materials Synthesis and Processing, Principles and Applications. 4 Hours.**

Processing and synthesis approaches, status, thermodynamics and process engineering, microstructure development, silicon production, chemical vapor deposition of ceramics and semiconductors, plasma processing in CVD. Prerequisite: ChE 311 or CEMM 364 or consent of the instructor.

**463. Materials for Microelectromechanical Systems. 4 Hours.**

Processing and characterization of materials for use in microelectromechanical devices. Mechanical, electrical, dielectric, and magnetic properties of materials relevant to microscale applications. Prerequisite: CEMM 260.

**464. Processing and Properties of Ceramics. 4 Hours.**

Introduction to the processing, technology, and properties of ceramic materials. Prerequisite: CEMM 260.

**465. Introduction to Polymer Engineering. 4 Hours.**

Structure of polymer molecules. Polymer chain flexibility. Super-molecular structure of polymers. Glass transition temperature. Deformation and failure mechanisms in amorphous and semi-crystalline polymers. Prerequisite: CEMM 260.

**470. Physical and Mechanical Properties of Materials. 4 Hours.**

Basic metallurgical phenomena; kinetics and phase stability; diffusion and transformation rates. Mechanical properties of materials; creep; fatigue and fracture. Prerequisite: CEMM 260.

**471. Thermodynamics of Materials. 4 Hours.**

Application of chemical and thermodynamic principles to processing and characterization of materials. Prerequisite: CEMM 260.

**472. Transport Phenomena in Foundry and Solidification Processing. 4 Hours.**

Heat and mass transfer applied to foundry and solidification processes. Properties of molds and molding materials. Metallurgy of casting alloys and cast metal matrix composites. Computer simulation of solidification. Includes laboratory. Prerequisite: CEMM 364.

**474. Principles of Deformation Processing. 4 Hours.**

Applicable to metals, ceramics, and polymers. Fundamentals of deformation at high rates, temperatures, strains and friction, stress system, constraint. Analyses of rolling forging, drawing extrusion, powder consolidation. Prerequisites: ME 203 and CEMM 372.

**478. Corrosion. 4 Hours.** Electrochemical concepts in corrosion; polarization, passivation, methods of corrosion control and oxidation. Prerequisite: CEMM 364.

**480. Welding Metallurgy. 4 Hours.**

Metallurgy of metals joining processes. Selection of processes and design of products manufactured by joining processes. Prerequisite: CEMM 368.

**483. Structure and Properties of Composite Materials. 4 Hours.**

Strength and ductility. Methods of toughening, composition and internal architecture, classification. Structure, morphology, and properties. Coupled and uncoupled systems. Failure modes of composite materials. Performance characteristics. Processing. Prerequisites: CEMM 260 and 265.

**493. Seminar. 1 to 3 Hours.** Topics of mutual interest to a faculty member and a group of students. Offered as announced in the timetable.

**494. Special Topics in Civil Engineering, Mechanics, and Materials. 1 to 4 Hours.**

May be repeated for credit. Students may register for more than one section per term. Subject matter varies from section to section and from semester to semester, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

**496. Special Problems. 1 to 4 Hours.** Special problems or reading by special arrangement with a faculty member. Prerequisite: Consent of the instructor.

**500. Design of Concrete Plate and Shell Structures. 4 Hours.**

Practical design of reinforced concrete slabs, walls, and shells of single and double curvatures. Includes barrel roofs, domes, and storage tanks. Prerequisite: CEMM 310.

**501. Urban Transportation. 4 Hours.** Transportation technology, and its relation to travel and location phenomena in large urban areas, as a basis for planning, operating and design of multimodal transportation systems. Prerequisites: CEMM 302 and Math 210 and Econ 120.

**502. Advanced Traffic Control Strategies. 4 Hours.**

Modeling approaches to traffic flow. Intersection, arterial and network control methods. Traffic simulation with emphasis on signal control logic. Prerequisite: CEMM 402 or consent of the instructor.

**504. Advanced Transportation Planning II. 4 Hours.**

Same as UPP 567. Analysis and design of transportation networks using methods from mathematical programming and optimal control theory; integration of travel choice models with urban location and network design models. Prerequisite: Consent of the instructor.

**505. Advanced Soil Mechanics. 4 Hours.**

Soil structure, stresses in soil mass, fluid flow, consolidation, drained and undrained shear strength, stress-strain relations, laboratory determination of strength and compressibility of soils. Prerequisite: CEMM 315.

**506. Physical/Chemical Principles in Environmental Systems. 4 Hours.**

Physical and chemical principles in natural and engineered environmental systems. Environmental process equilibria and rates. Reactor design and mass transfer in environmental systems. Multiphase environmental processes. Prerequisite: CEMM 216.

**508. Urban Travel Forecasting. 4 Hours.**

Theory and method of forecasting travelers' choices of route, mode, destination, departure time, trip frequency and origin location in congested urban transportation networks. Prerequisites: CEMM 302 and Math 210 and Econ 120.

**509. Transportation Networks. 4 Hours.** Application of constrained optimization methods to the analysis, planning and design of urban transportation networks. Prerequisites: CEMM 501 and CEMM 508 and Econ 501 and Math 484.

**510. Advanced Design of Prestressed Concrete Structures. 4 Hours.**

Analysis and design of indeterminate prestressed concrete members. Composite beams, torsion, deflections and design and detailing of connections, special topics such as anchorage zone design. Prerequisite: CEMM 410.

**512. Theory of Traffic Flow. 4 Hours.**

Theory of traffic flow, including statistical properties of traffic events, car following and traffic stream models. Queuing and gap acceptance processes at intersections and roadways. Prerequisites: CEMM 402 and Math 370 or the equivalents, or consent of the instructor.

**515. Embankments and Earth Structures. 4 Hours.**

Shear strength and consolidation of soils, slope stability analysis, embankments and earth dams, sheet pile walls, braced and tied back walls, slurry walls, tunnel supports. Prerequisite: CEMM 315.

**516. Design of Landfills and Impoundments. 4 Hours.**

Regulatory overview, site selection, waste characterization, design and construction of landfill and impoundment components, operations, performance monitoring, closure plans, long-term impacts and monitoring, economic analysis. Prerequisite: CEMM 315.

**518. Pollution Prevention Engineering. 4 Hours.**

Pollution prevention concepts, planning and economics. Improved manufacturing operations and life cycle assessment. Design for the environment, resource conservation and sustainable development. Prerequisite: CEMM 216.

**520. Earthquake Engineering of Concrete Structures. 4 Hours.**

Earthquake phenomena; response spectrum and design spectrum concepts; dynamic response of structures to earthquakes, methods of analysis; code approach to earthquake-resistant design; alternative approaches. Prerequisite: CEMM 310.

**521. Biological Treatment Fundamentals. 4 Hours.**

Fundamental processes for the biological treatment of wastewater, pollutants, and bioremediation. Growth and metabolism, kinetics, microbial ecology, biogeochemistry, and pollutant biodegradation. Prerequisite: Credit or concurrent registration in CEMM 422; or consent of the instructor.

**522. Water and Wastewater Treatment. 3 Hours.**

Same as EOHS 512. Water and wastewater characterization: physical, chemical and biological methods of water and wastewater treatment; regulatory and control trends; and environmental impact determinations. Prerequisite: CEMM 412 or consent of the instructor.

**523. Environmental Organic Chemistry. 3 Hours.**

Same as EOHS 543. Properties and behavior of environmental organic pollutants. Theory and estimation techniques. Concepts of environmental fate assessment. Applications of fate models. Prerequisite: CEMM 411.

**524. Water Chemistry. 3 Hours.**

Same as EOHS 542. Chemical equilibria and kinetic principles as applied to processes



occurring in natural and engineered water systems. Prerequisite: CEMM 411.

**525. Advanced Biological Treatment and Bioremediation. 4 Hours.** Advanced biological treatment processes. Stoichiometry of biological reactions, kinetics, bioremediation, biochemical pathways for pollutant biodegradation, immunological and genetic characterization of microbial cultures. Prerequisite: Credit or concurrent registration in CEMM 521; or consent of the instructor.

**526. Air-Quality Management II. 2 Hours.** Same as EOHS 532. Air quality management: Integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. Prerequisite: CEMM 419.

**528. Hydrometeorology. 4 Hours.** Evaporation, transpiration, and the surface energy budget; fluid mechanics and thermodynamics of the turbulent lower atmosphere applied to transport of water and other quantities. Prerequisite: CEMM 427 or consent of the instructor.

**530. Theory of Elasticity II. 4 Hours.** Review of complex variable theory. Complex variable formulation of plane problems. Singularities and crack problems. Prerequisite: CEMM 430.

**531. Nonlinear Continuum Mechanics. 4 Hours.** Matrices and general tensors, isotropic tensor functions, representation theorem, kinematics, polar decompositions, Cauchy-Green tensors, Cauchy stress, Piola-Kirchhoff stresses, constitutive laws, frame indifference, hyperelastic materials and universal solutions. Prerequisite: CEMM 430 or 431.

**532. Theory of Plates. 4 Hours.** Development of classical plate theory and boundary conditions and solutions to problems in rectangular and polar coordinates. Energy principles, large deflection theory, thick plate theory with applications. Prerequisite: CEMM 432.

**533. Fracture Mechanics and Failure Analysis II. 4 Hours.** Thermodynamics of irreversible processes. Damage parameter. Eshelby tensor. Crack-damage interaction. Dynamic crack growth. Quasistatic crack propagation. Crack layer theory. Crack driving forces. Fractographic analysis. Prerequisite: CEMM 433.

**534. Finite Element Analysis II. 4 Hours.** Application of the finite element method to the analysis of complex continuum and structural linear systems. Introduction to error analysis and convergence of the finite element solutions. Prerequisite: CEMM 434.

**535. Theory of Vibrations II. 4 Hours.** Same as ME 535. Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; floquet waves; nonlinear vibrations. Prerequisite: CEMM 435 or ME 408 or the equivalent.

**536. Nondestructive Testing of Concrete. 4 Hours.** Strength and durability of concrete structures by nondestructive evaluation of the material through acoustic, magnetic, thermal, electrical, optical phenomena; nondestructive methodologies for evaluation of concrete structures. Prerequisite: CEMM 310.

**537. Plasticity I. 4 Hours.** Basic postulates of plasticity. Yield condition and associated flow rules. Isotropic and kinematic hardening rules. Bounding problems. Finite element applications. Slip line theory.

**538. Wave Propagation in Solids I. 4 Hours.** Traffic flow, flood flow; elastic waves in rods; plastic waves in rods, combined stress waves and shock waves; waves in Timoshenko beams; the Riemann problem. Prerequisite: CEMM 430 or the equivalent.

**539. Elastic Stability. 4 Hours.** Elastic stability of columns, beams, and frames. Limitations of elastic theory, plastic buckling. Eigenproblems and their numerical solution. Elastic stability analysis by the finite element method. Prerequisite: CEMM 432.

**541. Mechanics of Composite Materials. 4 Hours.** Anisotropic elastic materials; stress analysis for isotropic materials; Stroh formalism for anisotropic materials; singularities at free-edges; stress analysis in composites; wave propagation in composites. Prerequisite: CEMM 430 or the equivalent.

**542. Theory of Shells. 4 Hours.** Differential geometry, kinematics of deformation, equations of equilibrium, energy theory, membrane theory, general bending theory. Prerequisite: CEMM 430

**543. Experimental Fracture Mechanics. 4 Hours.** Observational and measurement techniques. Error analysis and data reduction. Review of fracture mechanics models and fatigue life estimation methods. Experimental methods for calculating stress intensity factor and energy release rates. Methods for estimating life time. Prerequisite: CEMM 533.

**544. Structural Dynamics. 4 Hours.** Formulation and solution methods for time dependent systems. Pertinent numerical techniques and their application to seismic analysis, blast loading and heat transfer problems. Prerequisite: CEMM 434.

**550. Theory of Viscoelasticity. 4 Hours.** Laplace transforms, Stieltjes integrals; linear stress-strain laws; correspondence principles; encases viscoelastic cylinder; contact problems; beam-columns; vibration; thermoviscoelasticity. Prerequisite: CEMM 430 or the equivalent.

**554. Nonlinear Finite Element Analysis. 4 Hours.** Nonlinear elastostatics, consistent linearization, Newton and modified-Newton methods, line search techniques, arc-length methods. Hyperelasticity, B-bar type methods. Finite deformation elastodynamics, semi-discretization, time-stepping algorithms. Prerequisites: CEMM 531 and 534, or consent of the instructor.

**560. Advanced X-ray Diffraction. 4 Hours.** Single crystal methods in X-ray diffraction, determination of crystal structure, precise parameter measurement, phase diagram determination, X-ray spectroscopy. Prerequisite: CEMM 460.

**562. Electron Microscopy. 4 Hours.** Principles and experimental methods of electron microscopy of engineering materials. Discussion of electron optics and X-ray and electron spectroscopy. Selected laboratory experiments utilizing SEM. Prerequisite: Consent of the instructor.

**566. Interfacial Phenomena in Metals and Alloys. 4 Hours.** Principles of surface and interfacial phenomena in metals and engineering alloys. Treatment of solid-gas, solid-liquid, and solid-solid reactions at interfaces.

**568. Kinetics of Reactions and Phase Transformations in Metals. 4 Hours.** Nucleation and growth kinetics, order of transformation, grain growth recovery, recrystallization, solidification, phase transformation in solids, precipitation hardening, spinodal decomposition and martensitic transformations. Prerequisite: Consent of the instructor.

**570. Diffusion Phenomena in Materials. 4 Hours.** Diffusion mechanisms in crystals; Kirkendall effect; diffusion in ionic solids; diffusion in gases and liquids; diffusion through porous media; kinetics of diffusion controlled processes.

**572. Advanced Thermodynamics of Materials. 4 Hours.** Treatment of multicomponent system thermodynamics with emphasis on metallurgical process applications. Development of relation between structure of metallic solutions, molten salts, and quasi-chemical models.

**574. Deformation Mechanisms of Solids. 4 Hours.** Dislocation motion in solids; influence of impurities and point defects on dislocation velocities; hardening mechanisms; creep and fracture processes.

**594. Advanced Special Topics in Civil Engineering, Mechanics and Materials. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Subject matter varies from section to section and from semester to semester, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** Special problems of reading by special arrangement with a faculty member. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. MS thesis work under the supervision of a faculty member.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. PhD thesis work under the supervision of an advisor.

## Classics (CI)

**401. Topics in Greek History. 4 Hours.** Same as Hist 401. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

**402. Topics in Roman History. 4 Hours.** Same as Hist 402. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

**404. Roman Law and the Civil Law Tradition. 4 Hours.** Same as Hist 404 and CrJ 404. Roman law and its relationship to values



and social structure; social analysis through law; continental law tradition. Prerequisite: CrJ 200 or Hist 203 or consent of the instructor.

**490. The Classics and Their Survival: Literature and Myth. 4 Hours.** All readings are in English. Classical myth and literature (Vergil, Ovid, and in particular, Seneca) with emphasis on survival and influence on later literature and culture. Prerequisite: One 200-level course in classics or graduate-level work in literature or consent of the instructor.

**498. Special Topics in Classical Civilization. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. All readings are in English. Advanced study of topics in classical civilization. Sample topic: Augustus and his image. Prerequisite: Two classics courses at the 200 level.

**499. Advanced Independent Study. 4 Hours.** Students may register for more than one section per term. Advanced independent study under faculty direction. Reading and papers on chosen topics for qualified students based on preparation and interest. Students must consult with faculty. Prerequisites: Consent of the faculty member and the department.

## **Committee on Institutional Cooperation (CIC)**

**500. Committee on Institutional Cooperation. 0 to 16 Hours.** Students may register for more than one section per term. Holding course for UIC doctoral students taking approved course work at other institutions through the CIC Traveling Scholar Program. Prerequisites: Admission to a doctoral program and approval of the Graduate College.

## **Communication (Comm)**

**404. Discourse Analysis. 4 Hours.** Nonverbal aspects of communication; rules of communication; speech acts; conversational coherences; acts and sequences in communication; marital communication patterns. Prerequisite: Comm 304 or 315 or 416; or approval of the department.

**410. Rhetorical Criticism. 4 Hours.** Analysis and evaluation of critical standards for rhetorical interpretation. Application of critical standards to contemporary rhetorical events. Prerequisite: Comm 312 and 313; or approval of the department.

**416. Conflict and Communication. 4 Hours.** Students learn to manage and resolve conflict in business, governmental, and community settings. Practical analysis of interpersonal and group conflict cases. Prerequisite: Comm 312, 313 and 315; or approval of the department.

**430. Media, Information, and Society. 4 Hours.** News as a distinct form of mass communication, involving social functions and significant questions about facts, truth, knowledge, and values. Prerequisites: Comm 103, and 200 or 300; or approval of the department.

**434. Global Communication Systems. 4 Hours.** Same as LALS 434. Structure and flow of international communication. Media organization systems. International impact of new media and information technology. Impact of U.S. media reporting on foreign affairs. Prerequisites: Comm 300 or approval of the department.

**454. Psychology of Language. 3 Hours.** Same as Ling 474 and Psch 454. Introductory survey of methods, theory and research; linguistic foundations, history, and present status of the field.

**467. Public Opinion and Political Communication. 4 Hours.** Same as PolS 467. Nature of public opinion and political communication systems. Patterns of opinion distribution and its measurement. Forces shaping public opinion and its impact on public policy. Prerequisite: PolS 200 or the equivalent or consent of the instructor.

**473. Organizations and Their Publics. 4 Hours.** History of relevant theories and models; problem solving: analyzing goals, identifying publics, setting objectives, designing messages, choosing channels, planning implementation (budgeting, staffing, timetables), evaluating effects. Prerequisite: Comm 201 and 306; or approval of the department.

**474. Internship. 3 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. Only 3 hours may be counted toward the communication major. May not be counted toward the Master of Arts degree requirements. Students work in an

approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. Prerequisites: 12 hours of upper-division (200 or higher) courses in communication, with a 3.00 grade point average in those courses; recommendation of two faculty members and approval of department obtained in semester prior to internship.

**490. Communication, Culture, and Society. 4 Hours.** Same as Ling 490. Analysis of contrastive cultural paradigms (interethnic, gender, class) to develop student's awareness of own socialization and cultural orientation. Prerequisites: Comm 201 and 203, and at least two 300- or 400-level communication courses; or approval of the department.

**494. Special Topics in Communication. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Contemporary trends in the field of communication. Prerequisites: Comm 200 and 201 and consent of the instructor; or approval of the department.

**498. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. May not be counted toward the minimum MA in communication degree requirements. Individual investigation of special problems (student-initiated or related to faculty research). May be used for special projects, such as interdisciplinary seminars. Prerequisite: Approval of the department.

**500. Introduction to Communication Research. 4 Hours.** History of the field, research traditions, communication viewed as social science; forming research questions, reviewing and critiquing literature, formulating hypotheses and rationale, conceptually defining variables. Prerequisite: Consent of the instructor or graduate standing in communication.

**501. Operationalizing Communication Research. 4 Hours.** Levels of measurement; operational definitions; sampling qualitative and quantitative designs; coding and analysis of data; statistics; pilot testing and instrument/design revision; writing research reports. Prerequisite: Comm 500.

**502. Seminar in Media Studies. 4 Hours.** In-depth, intensive examination of theories, perspectives, and approaches to media studies. Prerequisite: Comm 500 or consent of the instructor.

**503. Seminar in Intercultural Communication. 4 Hours.** Introduction to basic theoretical concepts and important issues in intercultural communication. Prerequisite: Comm 500 or consent of the instructor.

**505. Organizational Communication. 4 Hours.** Classic and current research. Models that examine organizational communication; assessment of organizational problems and conduct of problem-solving research. Prerequisites: Comm 306 and 500, or consent of instructor.

**506. Cross-Cultural Communication. 4 Hours.** Same as Ling 506. Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (interactional etiquette, discourse rules).

**524. Developmental Psycholinguistics. 3 Hours.** Same as Ling 572 and Psch 523. Theories, research methods and research findings in the area of language development. Biological, cognitive, and social influence; disorders of language development. Prerequisite: Consent of the instructor.

**525. Approaches to Rhetorical Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Contemporary approaches to rhetorical criticism. Each offering focuses upon the distinctive contributions of specified rhetoricians to the theory and practice of rhetorical criticism. Prerequisite: Comm 410.

**534. Mass Communication Theory. 4 Hours.** Introduction to major theories of mass communication: their social history and substantive claims; distinction between mass mediated and other forms of communication, implications of distinction.

**567. Topics in Political Communication. 4 Hours.** Same as PolS 567. Intensive study of selected aspects; organizational communication in public institutions, urban political communication patterns, communication elites. Independent research using a variety of community research techniques. Prerequisite: Consent of the instructor.

**580. Qualitative Methods in Communication. 4 Hours.** Same as Ling 582. Qualitative methods course analyzing language and culture patterns. Prerequisite: Comm 501 or consent of the instructor.

**591. Health Communication. 4 Hours.** Focusing on interpersonal, organizational and public contexts, seminar participants

will review current literature in health communication, and apply selected communication concepts to health-related situations. Prerequisite: Graduate standing in communication or enrollment in a health professions school or college or consent of the instructor.

**592. Cross-Cultural Health Communication: Ethnicity, Class, and Gender. 4 Hours.** Using theory and students' experiences, this course examines cultural values, assumptions and communicative practices in terms of their implications for patients and health practitioners. Prerequisites: Graduate standing in communication or enrollment in a health professions school or college or consent of the instructor.

**594. Advanced Special Topics in Communication. 1 to 4 Hours.** May be repeated for credit. Student may register for more than one section per term. Advanced topics in communication theory and research. Subject matter varies. Prerequisite: Consent of the instructor.

**596. Independent Research. 1 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Department approved research projects not included in thesis research. Prerequisites: Consent of the head of the department.

**598. Thesis Research. 0 to 16 Hours.** S/U grade only. Students may register for more than one section per term. Under guidance of an advisor and committee the student develops and conducts a research project addressing a communication problem of a basic or applied nature. Prerequisite: Comm 501.

## Community Health Sciences (CHSc)

**400. Public Health Concepts and Practice. 3 Hours.** Concepts, principles and case studies which provide an overview of the philosophy, purpose, history, organization, functions, tools, activities, and results of public health practice. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

**403. The Future of Public Health. 2 Hours.** Key public health issues in the United States since the late 1970s. Review of major governmental reports and discussions by public health practice experts.

**405. Leadership in Public Health Practice. 3 Hours.** Same as HPA 405. Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. Prerequisites: CHSc 400 and consent of the instructor.

**411. Nutrition for Public Health Professionals. 3 Hours.** Foundation course to introduce nutrition principles and their application to public health populations and problems. Prerequisite: CHSc 400 or consent of the instructor.

**413. Principles of Delivering Public Health Nutrition Services. 3 Hours.** Same as HN 413. Assessment, planning and evaluation of community nutrition programs using a systems approach. Prerequisite: CHSc 411 or consent of the instructor.

**419. Public Health Aspects of Sexuality and Women's Health. 3 Hours.** Same as GWS 419. An overview of human sexuality from a public health view with special emphasis on family planning, sexuality and behavior effects on women's health.

**421. Family Perspectives on Disability. 3 Hours.** Same as DHD 420 and Dis 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

**425. Public Health and Aging. 3 Hours.** Gerontological public health issues are examined through the psychosocial and physical dimensions of the aging process and interactions between the elderly and the health care system. Prerequisite: CHSc 400 or consent of the instructor.

**432. Analytic Methods in Public Health. 3 Hours.** Provides analytic and computer skills needed for assessment and planning in public health and for maximizing the acquisition and use of public health data. Prerequisites: Bstt 400 and Epid 400 and CHSc 400.

**433. Public Health Planning and Evaluation. 3 Hours.** Planning and evaluation for community health programs, including proposal development and evaluation; considerations for community/consumer involvement in planning process. Prerequisite: Credit or concurrent registration in CHSc 442 and CHSc 480 or consent of the instructor.

**434. Introduction to Qualitative Methods in Public Health. 3 Hours.** Introduction to the major techniques used in qualitative research (observation, participant observation, in-depth interviews). Includes field and in-class exercises, and introduces computer-assisted qualitative data analysis.

**441. Introduction to Maternal and Child Health. 3 Hours.** Same as GWS 441. Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. Prerequisite: Consent of the instructor. Recommended background: Some knowledge of maternal and child health issues.

**442. Introduction to Assessment in Public Health. 2 Hours.** Conceptualization and measurement of community health status. Epidemiologic, sociocultural and health systems approaches to assessment, qualitative and quantitative examples, and political and group processes. Prerequisites: Bstt 400, Epid 400 and CHSc 400.

**446. Research Methods in Community Health. 3 Hours.** Introduction to principles and techniques for scientific investigation of problems in public health research and practice; planning and proposal development; ethics; research design; subject selection; measurement; data collection; program evaluation; and reporting results. Prerequisite: Bstt 400 or the equivalent.

**447. Survey Planning and Design. 2 Hours.** Theory and applications of sample survey planning and design for conducting research in health sciences and related fields. Addresses three major topics: survey design and planning, sampling and data collection procedures. Prerequisite: Bstt 400 or the equivalent. Credit in CHSc 446 or the equivalent is recommended.

**450. Introduction to International Health. 3 Hours.** Survey of health conditions focusing on Third World issues including consequences of population trends, disease prevalence, prevention/control, and technology transfer in socio-economic context.

**454. Women, Health, and International Development. 3 Hours.** Introduction to health and development for women in the developing world, including gender analysis, poverty, education, economic productivity, mortality and morbidity patterns and psychosocial health. Prerequisite: CHSc 400 or consent of the instructor.

**456. Women's Health: A Primary Health Care Approach. 3 Hours.** Same as NuPH 455 and NuSc 455 and NuWH 455. Health promotion and disease prevention in women's health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

**460. Public Health Aspects of Mental Health. 2 Hours.** Basic concepts of the community mental health movement: issues of deviance, psychiatric diagnosis, prevention and service delivery. Prerequisite: CHSc 400 or consent of the instructor.

**461. Public Health Aspects of Family Violence. 2 Hours.** The theory, etiology, treatment and prevention from a public health perspective of child abuse, child sexual abuse, spouse abuse, and elder abuse. Prerequisite: CHSc 400 or consent of the instructor.

**463. Public Health Aspects of Lifetime Disability. 3 Hours.** Surveys psychological, sociological, economic, and health related issues of lifetime disability as they affect individuals and their families; includes problems of physical and mental handicaps. Prerequisite: CHSc 400 or consent of the instructor.

**464. Survey of Developmental Disabilities. 3 Hours.** Same as DHD 464. Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research. Prerequisite: Consent of the instructor.

**480. Health Education and Health Promotion. 3 Hours.** Theories of health, illness behavior and health education for public health professionals; classical health interventions and surveys, approaches for individual and group behavior change.

**485. Communications, Mass Media and Public Health. 3 Hours.** Examines the development, theoretical bases, and assessments of mass media interventions, and the intended and unintended effects of the mass media in society.

**494. Special Topics in Community Health Sciences. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Special topics in community health sciences are presented. Prerequisite: Consent of the instructor.

**500. Proseminar in Community Health Sciences. 3 Hours.** Analysis of current key literature from behavioral sciences,

maternal and child health, gerontology, general and miscellaneous fields of community health sciences. Prerequisites: CHSc 400 and 8 semester hours in student's major field.

**501. Foundations of Public Health Inquiry. 3 Hours.**

Examination of research paradigms, precepts of theory development, literature synthesis, and ethical principles, all enhance the scholarship and meaningfulness of doctoral students' public health inquiry. Prerequisite: CHSc 400.

**514. Nutritional Epidemiology. 3 Hours.** Examination of nutritional epidemiological techniques to the design of population-based nutrition research. Students complete research proposal using nutritional assessment, epidemiology and research skills. Prerequisites: CHSc 411 and Epid 400 and 401, or consent of the instructor.

**520. Socio-Economic Aspects of Family Planning. 3 Hours.** The social and economic determinants of population and family planning, projections to the future and trends in contraceptive use in both developed and developing countries. Prerequisite: CHSc 450 or consent of the instructor.

**525. Dying, Grief and Hospice. 3 Hours.** An interdisciplinary course stressing team management of dying persons and their families; includes hospice concepts and a hospice practicum. Prerequisite: CHSc 425 or 426, or consent of the instructor.

**527. Critical Issues in Long Term Care Policy. 3 Hours.** Same as HPA 527. Long-term care organization, financing, delivery utilization and policy, emphasizing affordability, access and quality in a managed care environment. Prerequisites: CHSc 400 and 425 or consent of the instructor.

**528. Societal Analysis of Aging, Health and Health Care. 3 Hours.** Same as Soc 528. Analysis of aging, health and health care issues mainly from sociological and public health perspectives. Review and application of appropriate concepts, theories and methods. Prerequisite: CHSc 425 or consent of the instructor.

**529. Gerontological Health/Illness Behavior. 2 Hours.** Perceptions and behaviors of older adults are examined in reference to illness prevention, health promotion and reactions to acute and chronic illness. Prerequisite: CHSc 480.

**542. Advanced Maternal and Child Health Applied Programs. 3 Hours.** Interventions and services in health care programs for maternal and child populations. In-depth program analysis and problem solving with emphasis on public sector programs, population needs and program evaluation. Prerequisite: CHSc 441.

**543. MCH Policy and Advocacy. 3 Hours.** Explores the social, economic and political dynamics which influence the development and implementation of MCH policy and U.S. health policy in general. Prerequisite: CHSc 441 or consent of the instructor.

**544. Public Health Aspects of Adolescent Health. 3 Hours.** Students research contemporary issues in adolescent health, relating them to physical and emotional development and to policy. Prerequisite: CHSc 441.

**545. Reproductive and Perinatal Health. 3 Hours.** Same as Epid 545. This course focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. Prerequisites: Bstt 400 and CHSc 400 and Epid 400 and consent of the instructor.

**546. Reproductive/Perinatal Epidemiology Data Seminar. 2 Hours.** Using existing relevant data bases with multiple exposures and perinatal outcomes, students will employ epidemiologic methods to examine the effect of various exposures on perinatal outcomes. Prerequisites: Bstt 401 and Epid 401 and consent of the instructor.

**547. Public Health Approaches to Maternal and Child Nutrition. 2 Hours.** Advanced seminar to integrate role and application of nutrition for maternal and child populations. Prerequisite: CHSc 411 or CHSc 441 or consent of the instructor.

**548. Readings in Reproductive and Perinatal Epidemiology. 1 Hour.** Advanced seminar in reproductive/perinatal epidemiology with particular emphasis on methodologic issues. Prerequisites: CHSc 441 and Epid 401 or consent of the instructor.

**554. International Health Studies. 2 Hours.** Examines global health patterns, and variation among nations on disease causation; provides critical reviews of comparative studies of specific health problems. Focus varies each offering. Prerequisite: CHSc 450 and 400, or consent of the instructor.

**564. Community Integration in Developmental**

**Disabilities. 3 Hours.** Same as DHD 564 and Dis 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

**565. Advanced Concepts in Work Rehabilitation. 4**

**Hours.** Same as OT 545. Presents current theory, research, and clinical practice in work-related rehabilitation of physically injured, psychiatric, and neurologically impaired clients. Prerequisite: Consent of the instructor.

**577. Survey Questionnaire Design. 3 Hours.** Concepts and strategies for developing survey questionnaires for various modes of survey data collection. Students develop and present questionnaires related to their individual interests. Prerequisite: CHSc 446 or 447; or consent of the instructor.

**584. Community Organizing for Health. 3 Hours.** Focus on the bases of facilitating community organizing processes in health promotion including theories, fieldwork tools, feminist and international perspectives. Field work required. Prerequisite: CHSc 480 or consent of the instructor.

**585. Health Advertising. 2 Hours.** Effects of pro- and anti-health advertising (e.g., for nutrition, alcohol, tobacco). Policies and laws regarding current controversies. Elements of ads and campaigns that effect behavior change. Prerequisite: CHSc 485.

**586. Health Behavior Interventions. 3 Hours.** Advanced concepts and strategies for the development, implementation, and evaluation of public health interventions to change health behaviors. Individual intervention project proposal or equivalent final paper required. Prerequisites: CHSc 446 and CHSc 480.

**594. Advanced Special Topics in Community Health**

**Sciences. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study of topics in maternal and child health, gerontology, psychosocial problems in health and illness, health care delivery, international health, aspects of community health. Prerequisites: Epid 400, Bstt 400, CHSc 400, and consent of the instructor.

**595. Seminar in Community Health Sciences. 1 to 3**

**Hours.** S/U grade only. Analysis of current research in community health sciences. Prerequisite: Consent of the instructor.

## Computer Science (CS)

**401. Computer Algorithms I. 4 Hours.** Previously listed as EECS 460. Same as MCS 401. Design and analysis of computer algorithms. Divide-and-conquer, dynamic programming, greedy method, backtracking. Algorithms for sorting, searching, graph computations, pattern matching, NP-complete problems. Prerequisites: Grades of C or better in Stat 381 and MCS 360; or CS 202.

**411. Artificial Intelligence I. 4 Hours.** Previously listed as EECS 484. Problem representation; rule-based problem-solving methods; heuristic search techniques. Application to expert systems, theorem proving, language understanding. Individual projects. Prerequisite: CS 202.

**415. Computer Vision I. 4 Hours.** Previously listed as EECS 487. Computer vision system design. Segmentation and representation of regions and boundaries; image filtering; object recognition; advanced topics (examples: texture, stereo, color); applications. Programming assignments. Prerequisite: CS 202 or MCS 360 or consent of the instructor.

**421. Natural Language Processing. 4 Hours.** Design of natural language processing systems; part-of speech tagging, statistical and symbolic parsers; semantic interpretation; discourse and dialogue processing; natural language generation; applications. Prerequisite: CS 301 or MCS 441.

**422. User Interface Design and Programming. 4 Hours.** Previously listed as EECS 478. User interface design, implementation, and evaluation; user-centered design methodologies, windowing systems, I/O devices and techniques, event-loop programming, user studies. Programming projects. Prerequisite: CS 340.

**426. Multimedia Computing. 4 Hours.** Processing multimedia information including video, images, audio, text, and specialty data. Multimedia sources, formats, operations, and algorithms. Implementation projects. Prerequisite: CS 202 or MCS 360 or consent of the instructor.

**440. Introduction to Software Engineering. 4 Hours.** Previously listed as EECS 470. Software life-cycle model, requirement specification techniques, large-scale software design techniques and



tools, implementation issues, testing and debugging techniques, software maintenance. Prerequisite: CS 340.

**441. Distributed Object Programming Using Middleware. 4 Hours.** Extensive computer use required. Design and implementation of distributed object programs using middleware software standards; interface definition languages and programming language mappings; static and dynamic object communication mechanisms. Prerequisites: CS 340 and CS 385.

**450. Introduction to Networking. 4 Hours.** Credit is not given for CS 450 if the student has credit in EECS 433 or ECE 433. Network protocols, algorithms, and software issues. Topics include the open systems interconnect model, data link, network and transport layers, TCP/IP, ATM, mobile networks. Prerequisites: CS 202 and CS 385, and either Stat 381 or Stat 401 or IE 342.

**455. Design and Implementation of Network Protocols. 4 Hours.** Network protocols and their software. Examines OS network interface through network layers. Topics include routing, congestion control, fault tolerance, security, name servers, multicast, and performance. Prerequisites: CS 340 and CS 450.

**466. Advanced Computer Architecture. 4 Hours.** Credit is not given for CS 466 if the student has credit in EECS 466 or ECE 466. Design of high performance computer architecture. Cost-performance; instruction sets; pipelining; memory hierarchy; I/O. Prerequisite: CS 366.

**469. Computer Systems Design. 4 Hours.** Credit is not given for CS 469 if the student has credit in EECS 469 or ECE 368 or ECE 469. Analysis and modeling of digital systems; hardware description languages; CAD tools for simulation, synthesis, and verification of computer systems. Project: a simple processor design. Prerequisite: CS 366.

**472. Testing and Verification of Real-Time Software. 4 Hours.** Previously listed as EECS 472. Correctness properties, modeling and specification languages, testing and automatic verification techniques for concurrent and real-time systems. Ada programming projects. Lab assignments with automatic verification tools. Prerequisites: CS 301 and CS 385 and CS 440.

**473. Compiler Design. 4 Hours.** Previously listed as EECS 473. Same as MCS 411. Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. Prerequisites: Grade of C or better in either CS 301 or MCS 441, and in either CS 202 or MCS 360 and CS 266.

**474. Object-Oriented Languages and Environments. 4 Hours.** Previously listed as EECS 474. Data abstraction, classes and objects, messages and methods, polymorphism and dynamic binding, inheritance. Object-oriented design. Pure and hybrid object-oriented languages. Prerequisite: CS 340.

**475 Object-Oriented Programming. 4 Hours.** No credit given if the student has credit in CS 340 or CS 474. OO Paradigm: classes, messages, methods, variables, inheritance, polymorphism; the C++ and Java languages; programming labs required. Extensive computer use required. Prerequisites: CS 202; and consent of the instructor.

**476. Programming Language Design. 4 Hours.** Previously listed as EECS 476. Same as MCS 415. Definition, design and implementation of programming languages. Syntactic and semantic description; variable bindings, control and data structures; parsing, code generation, optimization; exception handling; data abstraction. Prerequisites: MCS 261 and MCS 275; or CS 340.

**480. Database Systems. 4 Hours.** Database design, logical design, physical design. Relational databases. Recovery, concurrency control. Normalization. Previously listed as EECS 480. Prerequisite: CS 202.

**485. Networked Operating Systems Programming. 5 Hours.** Previously listed as EECS 471. Concepts, design, and programming of multiprocess and distributed systems; interprocess communications; fault tolerance; distributed programming semantics. Programming assignments and project required. Prerequisite: CS 385.

**488. Computer Graphics I. 4 Hours.** Previously listed as EECS 488. Same as AD 488. Principles of interactive computer graphics. Raster and vector display, techniques and hardware considerations. Introduction to two-dimensional and three dimensional rendering. Laboratory. Prerequisite: Credit or concurrent registration in CS 340.

**491. Seminar. 1 to 4 Hours.** Previously listed as EECS 491. May be repeated for credit. Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the Timetable. Prerequisite: Consent of the instructor.

**493. Special Problems. 2 to 4 Hours.** Previously listed as EECS 493. No graduate credit for computer science majors. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.

**501. Computer Algorithms II. 4 Hours.** Previously listed as EECS 562. Same as MCS 501. Continuation of CS 401. Advanced topics in algorithms. Lower bounds. Union-find problems. Fast Fourier transform. Complexity of arithmetic, polynomial, and matrix calculations. Approximation algorithms. Parallel algorithms. Prerequisite: CS 401.

**503. Applied Graph Theory. 4 Hours.** Previously listed as EECS 563. Paths, circuits, trees, cutsets, planarity, duality, matrices and vector space of graphs, directed graphs, coloring, covering, matching and applications to switching networks and computer science. Prerequisite: Consent of the instructor.

**505. Computability and Complexity Theory. 4 Hours.** Previously listed as EECS 561. Turing machines, undecidability, Rice's theorem, recursively enumerable sets, complexity theory, hierarchy theorems, alternation, parallel complexity classes, complete problems. Prerequisite: CS 301.

**511. Artificial Intelligence II. 4 Hours.** Previously listed as EECS 584. Predicate logic and resolution strategies, reasoning under uncertainty, incomplete information reasoning, state and change, planning, temporal reasoning knowledge representation, learning, advanced search techniques and current topics. Prerequisite: CS 411.

**513. Logic Programming. 4 Hours.** Previously listed as EECS 583. Logic programming theory and its application to databases, knowledge representation and knowledge bases. Prerequisite: CS 411 or 480 or consent of the instructor.

**514. Expert Systems. 4 Hours.** Previously listed as EECS 585. Anatomy of expert systems, types of expert systems, architecture of an expert system, expert system tools, building an expert system; expert systems in the marketplace. Prerequisite: CS 411.

**515. Advanced Computer Vision. 4 Hours.** Previously listed as EECS 587. Analysis of 3-D scene images. Shape from shading, texture, line drawings, and surface orientation. Surface representation methods and reconstruction of 3-D scenes. Design of knowledge-based vision systems and 3-D applications in robotics and industrial environments. Prerequisite: CS 415.

**522. Human-Computer Interaction. 4 Hours.** Previously listed as EECS 578. The computer-user interface: media, languages, interaction techniques, user modeling. Human factors in software development. Theory, experimental methods, evaluation, tools. Project required. Prerequisites: CS 422.

**523. Multimedia Systems. 4 Hours.** Previously listed as EECS 579. Principles of multimedia interface design for computer applications. Multidisciplinary approaches to integrating text, still images, animation, and sound into human-computer interfaces. Prerequisite: CS 422 or consent of the instructor.

**526. Computer Graphics II. 4 Hours.** Previously listed as EECS 588. Same as AD 588. State of the art in computer graphics and interactive techniques: three-dimensional surface and volumetric models. A laboratory is required. Prerequisite: CS 488.

**527. Computer Animation. 4 Hours.** Previously listed as EECS 589. Theoretical and practical aspects of computer animation and computer-assisted animation in two and three dimensions and in black and white or full color. Laboratory. Prerequisite: CS 488.

**528. Virtual Reality. 4 Hours.** Previously listed as EECS 590. Principles of virtual reality and virtual environments. Hardware, software and design issues in presenting images and sound in immersive environments. Input and control devices. Quantitative assessment of virtual reality systems. Prerequisite: CS 488.

**540. Advanced Topics in Software Engineering. 4 Hours.** Previously listed as EECS 570. Formal methods; requirements and specification languages; program flow analysis; validation and verification; software metrics; program representations; software tools; software testing; software process. Prerequisite: CS 440 or consent of the instructor.

**541. Software Engineering Environments. 4 Hours.** Previously listed as EECS 571. Software configuration management;



software quality assurance; software engineering economics; software factory; software reuse; computer-aided software engineering; software prototyping. Prerequisite: CS 540 or consent of the instructor.

**542. Distributed Software Engineering. 4 Hours.**

Previously listed as EECS 572. Fundamental concepts of distributed software. Task allocation algorithms, language concepts for concurrency and communication, analysis methods and tools, and formal models. Prerequisite: CS 440.

**545. Formal Methods In Concurrent and Distributed Systems. 4 Hours.** Previously listed as EECS 575. Formal methods in concurrent and distributed systems, particularly temporal logic and automata for specifying and reasoning real-time properties. Automated and manual techniques for checking correctness. Prerequisite: Consent of the instructor.

**553. Distributed Computing Systems. 4 Hours.** Previously listed as EECS 573. Distributed computing systems terminology and design issues. Data communications protocols; distributed operating systems, resource management, and synchronization; security; database systems. Prerequisites: CS 366 and 385.

**554. Advanced Topics in Concurrent Computing Systems. 4 Hours.** Previously listed as EECS 564. Petri nets, methods and their applications to concurrent, distributed, parallel, and data-flow systems; logic programming and rule-based systems. Prerequisite: Consent of the instructor.

**559. Neural Networks. 4 Hours.** Previously listed as EECS 559. Artificial neural networks for parallel computing including perceptrons, backpropagation and Kohonen nets, statistical methods in neural computing, Hopfield nets, associative memories, cognition and neocognition. Prerequisite: Consent of the instructor.

**560. Fuzzy Logic. 4 Hours.** Previously listed as EECS 560. Crisp and fuzzy sets; membership functions; fuzzy operations; fuzzy relations and their solution; approximate reasoning; fuzzy modeling and programming; applications; project. Prerequisite: Consent of the instructor.

**565. Algorithms for VLSI Physical Design. 4 Hours.** No credit given if the student has credit in ECE 565 or EECS 565. Computer-aided physical design of integrated circuits; circuit partitioning and placement; floorplanning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation. Prerequisites: CS 401 and CS 469; or consent of the instructor.

**566. Parallel Processing. 4 Hours.** Previously listed as EECS 566. Parallel processing from the computer science perspective. Includes architecture (bus based, lockstep, SIMD), programming languages (functional, traditional and extensions), compilers, interconnection networks, and algorithms. Prerequisite: CS 466.

**569. High-Performance Processors and Systems. 4 Hours.** Previously listed as EECS 569. Instruction-level parallelism, multiple-instruction issue, branch prediction, instruction and data prefetching, novel cache and DRAM organization, high-performance interconnect, compilation issues, case studies. Prerequisite: CS 466.

**577. Object Stores. 4 Hours.** Previously listed as EECS 577. Use, design, and implementation of object stores. An object store enables object-oriented programming to be extended by storing objects on disk and communicating objects between processes. Prerequisites: CS 385 and 480 and knowledge of C++, or consent of the instructor.

**580. Query Processing in Database Systems. 4 Hours.** Previously listed as EECS 580. Same as IDS 511. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: CS 480.

**581. Database Management Systems. 4 Hours.** Previously listed as EECS 581. Concurrency control; reliability, recovery, data integrity, database machines and current topics. Prerequisite: CS 480.

**582. Information Retrieval. 4 Hours.** Previously listed as EECS 582. Document retrieval, office automation. Optimal retrieval, relevance feedback, clustered search, construction of clusters, model of term weighting, thesaurus construction, multimedia data, handling of audio and video. Prerequisite: CS 480.

**594. Special Topics. 4 Hours.** Previously listed as EECS 594. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

**595. Departmental Seminar. 0 Hours.** Previously listed as EECS 595. May be repeated. S/U grade only. Seminar by faculty and invited speakers.

**596. Individual Study. 1 to 4 Hours.** Previously listed as EECS 596. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Individual study or research under close supervision of a faculty member. For CS majors only. Prerequisite: Consent of the instructor.

**597. Project Research. 0 to 9 Hours.** Previously listed as EECS 597. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. A research design or reading project approved by the committee appointed by the director of graduate studies. Prerequisite: Consent of the instructor.

**598. MS Thesis Research. 0 to 16 Hours.** Previously listed as EECS 598. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. MS thesis work under the supervision of a graduate adviser. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** Previously listed as EECS 599. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. PhD thesis work under supervision of a graduate adviser. Prerequisite: Consent of the instructor.

## Criminal Justice (CrJ)

**402. Trial Interaction. 4 Hours.** Same as Ling 402. Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. Prerequisites: CrJ 261 and CrJ 350, or consent of the instructor.

**404. Roman Law and the Civil Law Tradition. 4 Hours.** Same as Hist 404 and CL 404. Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. Prerequisite: CrJ 200 or Hist 203 or consent of the instructor.

**405. The Problem of Justice. 4 Hours.** Same as PolS 405. Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. Prerequisites: CrJ 101, plus two 200-level courses in criminal justice or two 200-level courses in political science.

**421. Juvenile Justice System. 4 Hours.** Theories of juvenile delinquency and rule-breaking; juvenile rights; organization and administration of the juvenile justice system in the U.S. Prerequisites: CrJ 210 and 220.

**422. Victimization. 4 Hours.** Survey of criminal victimization theory and research. Examination of causes, consequences, and prevention of violent crime and of victims' experiences in the criminal justice system. Prerequisites: CrJ 101 and two 200-level criminal justice courses.

**423. Violence. 4 Hours.** Same as Anth 424. Explores how men and women have experienced violence historically and in modern times. Students examine how violence is perpetrated through words, pictures, physical harm, and silences. Prerequisites: CrJ 101 and CrJ 200.

**424. Gender, Crime, and Justice. 4 Hours.** Same as GWS 424. An in-depth examination of the etiology of female crime and the involvement of females in the criminal justice system as offenders, victims, and workers/professionals. Prerequisites: CrJ 101 and CrJ 220 or consent of the instructor.

**435. Organized and White Collar Crime in the United States. 4 Hours.** Analysis and evaluation of organized crime, including its public perception; sociological, political, and economic impacts as well as past and present enforcement strategies. Prerequisite: Two 200-level criminal justice courses.

**440. History of Criminal Justice Institutions. 4 Hours.** Topics in law, jurisprudence, enforcement and punishment and their social settings, from classical times to mid-twentieth century, mainly in civil and common law traditions. Prerequisites: CrJ 245 or 250 or 255, plus one other 200-level criminal justice course.

**442. Comparative Criminal Justice Institutions. 4 Hours.** Comparative study of law, jurisprudence, enforcement, and punishment in Western and non-Western societies, including civil law, common law, and Islamic systems. Prerequisite: Two 200-level criminal justice courses.

**446. Emergency and Crisis Management. 4 Hours.** The application of theories of multidisciplinary approaches to planning for

the mitigation, preparation, emergency response, and recovery from major incidents or mega-disasters which threaten the safety and security of the public and its institutions. Prerequisites: Completion of CrJ 240 and one course from among the CrJ 345, 350, or 355.

**456. Community Corrections. 4 Hours.** History, processes, and functions of programs organized for sanctioning offenders in community settings, such as probation, parole, halfway houses, restitution, community service, home confinement. Prerequisites: CrJ 350 or 355; plus one 200-level criminal justice course.

**480. Application of Science to the Law. 4 Hours.** Same as BpS 480. Issues affecting the development, accessibility and admissibility of forensic science services by the criminal justice system; problems which may compromise the quality, fairness and effectiveness of scientific inquiries.

**490. Topics in Rule Making. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Content of course varies, addressing major issues. Prerequisites: Six 200- or 300-level courses in criminal justice.

**491. Topics in Rule Breaking. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Content of course varies, addressing major issues. Prerequisites: Six 200- or 300-level criminal justice courses.

**492. Topics in Rule Application. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Content of course varies, addressing major issues. Prerequisites: Six 200- or 300-level criminal justice courses.

**500. Law and Society. 4 Hours.** Emergence and growth of rule-governed social order; social organization of legal actors; functional aspects of law including social control, dispute resolution; rule interpretation; and the promotion of social and economic enterprises.

**519. Topics in Legal Studies. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Selected areas of legal administration where appellate courts have reviewed and created norms of official behavior such as wiretapping, competency of defense counsel and prisoners' rights. Prerequisite: Consent of the instructor.

**520. Criminological Theory. 4 Hours.** Critical examination of major traditions in criminological theories: emphasis on critical, positivist, interpretivist, and postmodern.

**521. Contemporary Theories of Rule Breaking. 4 Hours.** Critical examination of contemporary theories of crime and delinquency, including functional, anomic, differential association, labeling, and conflict theories.

**539. Seminar in Rule Breaking. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a specific area of rule-breaking such as larceny, criminal violence, corporate crime, political crime, public order criminality or occupational crime. Content varies. Prerequisite: Consent of the instructor.

**540. Criminal Justice: Process and Institutions. 4 Hours.** Critical examination of the criminal justice system. The dynamics and processes of contemporary police, judicial, and correctional institutions are evaluated in the context of key historical developments and relevant research.

**541. The Dynamics of Behavior in Criminal Justice Agencies. 4 Hours.** Leading theories of organizational behavior used to interpret organizational patterns, functions, and constraints in rule-applying institutions; emphasis on the application of these theories to the problems of planned change.

**543. Systems Concepts: Interaction and Change. 4 Hours.** Analysis of the criminal justice system as a system. Interorganizational structure, the interaction of component parts, organizational analysis, problem formulation, analytic systems methodology, and planned organizational and systems changes and their consequences. Prerequisite: CrJ 540.

**545. Law Enforcement and Order Maintenance. 4 Hours.** Review of major studies of police/investigative agencies. Analysis of research on their leadership, organizational priorities, reactive and proactive strategies, and ethical context. Prerequisite: CrJ 540.

**546. Violence and Victimization. 4 Hours.** The field of victimology and victimization theories are introduced including characteristics of victims, crime and postcrime victimization effects, and victim criminal justice system experiences.

**547. Race, Class, and Gender Dimensions of Crime and Justice. 4 Hours.** Same as GWS 547. Theories addressing the intersections of race, class, gender, crime, and justice. Specifically, students examine criminological theories, social construction of race, class, and gender, legal decision-making, and implications of this for justice in our society.

**548. Legal Discourse and Culture in Law and Society. 4 Hours.** Discourse, power, and culture in legal settings and analysis of power and resistance in the construction of law as a social fact. Prerequisite: CrJ 500.

**550. Criminal Prosecution and Adjudication. 4 Hours.** Institutional, organizational, and role factors in criminal court behavior and decision making by prosecutors, defense attorneys, judges, juries, defendants, witnesses, and probation officers. Comparison of legal standards with practice. Prerequisite: CrJ 500 or 540.

**552. Dispute Processing. 4 Hours.** Examination of the distinctive features and interrelationships of dispute processing by avoidance, negotiation, mediation, arbitration, and adjudication. Emphasis on historical and cross-cultural materials. Prerequisite: CrJ 500.

**555. Corrections: Institutions and Field Operations. 4 Hours.** Examines institutions and field services in public and private sectors. Addresses historical and empirical approaches to the analysis of policy and correctional effectiveness; the neo-classical challenge to rehabilitation, and corrections case law. Prerequisite: CrJ 540.

**557. Behavioral Consequences of Punishment. 4 Hours.** Analysis of research on the relationship between criminal sanctions and the correctional goals of retribution, incapacitation, deterrence, and rehabilitation. Prerequisite: CrJ 560 or the equivalent, or consent of the instructor.

**560. Quantitative Methods and Design. 4 Hours.** Fundamentals of scientific inquiry, the logic of casual inference, and qualitative methods. Development of critical perspective and identification of weaknesses in research design and measurement. Development of skills in proposal development and data collection unique to criminal justice. Prerequisite: CrJ 262 or consent of the instructor.

**561. Qualitative Methods and Design. 4 Hours.** Theories and techniques of qualitative research methods, particularly fieldwork and in-depth interviews. Criminal justice problems amenable to these techniques and methods and interrelationship between the researcher role and substantive findings. Prerequisite: CrJ 262 or consent of the instructor.

**562. Statistical Applications in Criminal Justice I. 4 Hours.** Basic descriptive and inferential statistics, their applications in data analysis, and assumptions underlying use of these procedures in criminal justice research. Prerequisite: CrJ 262 or the equivalent.

**563. Evaluation Research in Criminal Justice. 4 Hours.** Experimental, quasi-experimental, and nonexperimental approaches to evaluation research; indicators of effectiveness. Applications to crime prevention, police, courts, and correctional programs. Politics of researcher-agency interactions. Prerequisites: One graduate-level course in research methods and consent of the instructor.

**564. Statistical Applications in Criminal Justice II. 4 Hours.** Introduction to multivariate statistics with emphasis on multiple regression in criminal justice research, analysis and interpretation of regression output, coding of variables and path analysis. Prerequisite: CrJ 562.

**570. Advanced Methods in Criminal Justice. 4 Hours.** Methodological problems in criminal justice measurement including the identification problem in estimating deterrence and the limitations of survival analysis in estimating recidivism. Students are required to submit a paper demonstrating evidence of independent research skills. Prerequisite: CrJ 560 and CrJ 561 or the equivalent.

**579. Advanced Topics in Research Methods. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Intensive study of a specific area of multivariate analysis, time series, factor analysis, log-linear analysis, field, historical or legal research. Content varies. Prerequisite: Consent of the instructor.

**580. Forensic Science: Survey and Foundations. 3 Hours.** Same as BpS 580. Survey of forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, pattern evidence.

**581. Forensic Analysis of Biological Evidence. 4 Hours.** Same as BpS 581 and MLS 581. Forensic blood identification and typing; body fluid identification and typing; blood group, isoenzyme, serum protein typing; electrophoresis; isoelectric focusing; DNA typing; reporting results; expert testimony. Prerequisite: Consent of the director of graduate studies.

**582. Forensic Chemistry and Trace Evidence Analysis. 4 Hours.** Same as BpS 582. Trace evidence: hairs, fibers, glass, soil, paint and miscellaneous; nature, chemical, instrumental, microscopical methods of analysis; interpretation and significance of trace similarities; expert testimony. Prerequisite: Consent of the director of graduate studies.

**583. Physical Pattern Evidence Analysis. 4 Hours.** Same as BpS 583. Pattern evidence: individualization, reconstruction; fingerprint classification, latent print development, AFIS; questioned documents; ink, paper, handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction. Prerequisite: Consent of the director of graduate studies.

**584. Forensic Drug Analysis and Toxicology. 4 Hours.** Same as MLS 584 and BpS 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media. Emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the director of graduate studies.

**589. Special Topics in Forensic Science. 3 Hours.** Same as BpS 589. Content varies. Theoretical, philosophic, moral, and managerial problems associated with criminalistics practice. Quality control issues relating to evidence collection, analysis, reporting, and testimony.

**592. Internship in Criminal Justice. 2 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Placement in a criminal justice agency or setting under the supervision of a faculty member with an accepted research project and paper. Prerequisite: Consent of the instructor.

**593. Teaching Criminal Justice. 4 Hours.** Analysis of current trends in criminal justice education, discussion of the contextual setting of the field, and the development of rudimentary teaching skills.

**594. Selected Issues in Crime and Criminal Justice. 4 Hours.** May be repeated for a maximum of 12 hours. Students may register for more than one section per term. Current issues and advanced problem areas related to deviance, crime, etiology, labeling, criminal careers, organized crime and victimology.

**596. Independent Study or Research. 2 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. Research undertaken for this course may not duplicate that being done for CrJ 598. Supervised projects, which may consist of extensive readings in criminal justice, research on special problems not included in the regular course offering. Prerequisites: Consent of the instructor and approval of the director of graduate studies.

**597. Project Research. 0 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Satisfactory/Unsatisfactory grade only. Independent research project under the supervision of a faculty member. Prerequisites: Graduate standing in the MA in criminal justice program and consent of the instructor.

**598. Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for a maximum of 8 hours of credit. For students doing thesis research or writing. Prerequisites: Consent of the student's adviser and acceptance of the thesis topic and preliminary thesis outline by the thesis committee.

**599. Dissertation Research. 0 to 16 Hours.** May be repeated for a maximum of 20 hours of credit. Satisfactory/Unsatisfactory grade only. Research on the topic of the doctoral dissertation. Prerequisites: Consent of the faculty adviser and director of graduate studies.

## **Curriculum, Instruction, and Evaluation (CIE)**

**459. Foundations of Reading: Literacy and Society. 4 Hours.** Analysis of the economic, social, cognitive, and political antecedents and consequences of literacy. History of literacy development and its relationship to schooling in American society.

**460. Foundations of Reading Instruction. 4 Hours.** Principles and practices of reading instruction including classroom diagnosis, content-area reading, emergent literacy, and instructional materials and techniques. Prerequisite: CIE 459 or consent of the instructor.

**461. Instruction and Evaluation in the Elementary School. 5 Hours.** Theory and practice in curriculum development, planning instruction, implementing learning activities, using multiple resources, and assessing learning. School-based practicum. Prerequisites: Ed 402 or 403; Ed 421, 422 or 445; Ed 430; CIE 460 and a second reading methods course.

**462. Foundations of Secondary Reading Instruction. 4 Hours.** Issues concerning secondary school reading; instructional approaches for skill development within content areas. Prerequisite: Consent of the instructor.

**464. Bilingualism and Literacy in a Second Language. 4 Hours.** Theoretical foundations of second language acquisition and the teaching of English as second language. Methods and materials for teaching reading and writing to bilingual children.

**468. Children's Literature in the Content Areas. 4 Hours.** Effective use of children's literature to enrich instruction in language arts, social studies, science, and other subjects taught in the elementary and junior high schools. Prerequisite: One course in children's literature or consent of the instructor.

**469. Practicum in Teaching Reading. 1 to 4 Hours.** Emphasis on intensive, supervised practicum experiences and seminars in order to fill gaps in students' clinical experience in teaching of reading. Prerequisite: Consent of the instructor.

**472. Assessment and ESL Instruction for the LEP Student. 4 Hours.** Assessment of limited English proficiency (LEP) populations; information on instruments and procedures. Methods and materials for teaching English as a second language in school settings.

**480. Technology and Multimedia: Learning Tools in the Classroom. 4 Hours.** Same as SpEd 480. New technologies to support teaching and learning in precollege classrooms.

**481. Foundations and Cross-Cultural Issues in Educating LEP Students. 4 Hours.** Philosophical, theoretical, sociocultural, and educational examination of learning and achievement problems that culturally and linguistically different students face in American schools. Extensive field experience required.

**482. Assessment and Instruction: A Multicultural Perspective. 4 Hours.** Methods and materials for teaching LEP students in bilingual/ESL classrooms. Emphasis upon present curricular and methodological practices. Assessment for placement and instruction of bilingual students.

**483. Methodology of TESOL. 4 Hours.** Same as Ling 483. Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. Prerequisite: Consent of the instructor.

**484. Curriculum and Instruction in the Middle School. 3 Hours.** Philosophy, curriculum, and instructional methods for teaching middle grade students (grades five through eight). Content area reading is included. Prerequisites: Approval of the College of Education; and either Ed 402 or 403; and either Ed 421 or 422 or 445; and either Ed 430 or 431.

**494. Special Topics in Curriculum, Instruction, and Evaluation. 1 to 4 Hours.** May be repeated for a maximum of 12 hours. Students may register for more than one section per term. Exploration of an area not covered in existing course offerings. Content varies. Prerequisite: Consent of the instructor.

**500. Proseminar in Curriculum and Instruction. 1 Hour.** May be repeated for credit. S/U grade only. Research-oriented colloquia on issues in curriculum and instruction. Serves as introduction to faculty research interests. Provides opportunity to consider issues in research design. Prerequisite: Admission to the PhD in education program or consent of the instructor.

**501. Literature, Social Studies, and the Arts in the Elementary School. 4 Hours.** Theory and practice in curriculum development, planning instruction, and assessing learning in elementary classrooms. Literature, social studies, and the arts content foci. School-based practicum. Prerequisites: Ed 402 or 403; and either Ed 421 or 422 or 445; and Ed 430; and CIE 460; and a second reading course.

**502. Mathematics and Science in the Elementary School. 4 Hours.** Integrating mathematics and science content with issues of teaching and learning, including adapting and developing curriculum, planning, classroom interactions, and assessment in elementary classrooms. Prerequisites: Ed 402 or 403; and either Ed 421 or 422 or 445; and Ed 430; and CIE 460; and a second reading methods course.



**511. Student Teaching in the Elementary Grades I. 6 Hours.** May be taken concurrently with CIE 512. Culminating course in graduate elementary teacher education and early childhood education sequences. Meets Illinois State Board of Education requirements for certification. Prerequisites: CIE 501 and 502.

**512. Student Teaching in the Elementary Grades II. 6 Hours.** Extension of CIE 511. The culminating course in graduate elementary teacher education and early childhood education sequences. Meets Illinois State Board of Education requirements for certification. Prerequisites: CIE 501 and 502 and concurrent registration in CIE 511.

**520. The K-12 Mathematics Curriculum: Theory, Politics, and Reform. 4 Hours.** A look at the K-12 curriculum from three perspectives: theoretical (epistemological, learning, teaching), political (whose interests are served) and practical (implementation issues in schools). Prerequisite: Consent of the instructor.

**521. Learning and Teaching Mathematics with Technology. 4 Hours.** Can technology support conceptually-based learning of mathematics? Issues of learning, teaching, and equity related to technology in the K-12 mathematics classroom. Prerequisite: Consent of the instructor.

**522. Social Context of Mathematics Education. 4 Hours.** Examination of contextual, social, and linguistic factors which influence the learning of mathematics; emphasis on sociohistorical and activity theories; and equity in schooling. Prerequisite: Graduate standing in the College of Education or consent of the instructor.

**532. Staff Development and School Improvement. 4 Hours.** Analysis of issues of school improvement and teacher professional development. Emphasis on processes of and alternative approaches to individual and organizational change. Prerequisites: Consent of the instructor and one of the following: CIE 574; Ed 430, 431, or 543.

**539. Internship in Instructional Leadership. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Conceptualization, development, implementation, analysis, and interpretation of a curriculum and/or instructional improvement in an educational setting (supervised by university faculty and leadership from the setting). Prerequisite: CIE 532.

**540. Linguistics for Teachers. 4 Hours.** Introduction to linguistic concepts as they apply to teaching in monolingual and bilingual classrooms. Relation of linguistic theory to theories of language and cognition.

**545. Educational Evaluation. 4 Hours.** Examination of theoretical and operational assumptions of alternative evaluation models; analysis and critique of evaluation case-studies. Prerequisite: Admission to the PhD in education program or the PhD in public policy analysis program.

**550. Conflicts in Curriculum Development. 4 Hours.** Analysis of theoretical models for curriculum development; special attention to alternative and often conflicting viewpoints about the particulars of the development process. Prerequisite: Admission to a graduate program in education.

**551. Leadership and Educational Supervision. 4 Hours.** Same as PS 535. Theory and practice of supervisory leadership in educational settings; effects of interactive factors on performance assessment and professional development. Field experience requirement. Prerequisite: ED 430 or 431, or consent of the instructor.

**552. Curriculum and Cultural Context. 4 Hours.** Influence of cultural, political, sociological, and economic factors on curriculum at the instructional, institutional, societal, and ideological levels. Prerequisite: CIE 574 or consent of the instructor.

**553. History of Curriculum Thought. 4 Hours.** Analysis of selected documents on curriculum theory and policy from antiquity to present; secondary treatments and primary sources; interaction of theory and practice. Prerequisite: CIE 574, or consent of the instructor.

**555. Integrated Reading and Writing Instruction. 4 Hours.** Examination of the reading-writing relationship. Specific instructional strategies for teaching reading and writing together in the elementary grades. Prerequisite: CIE 460 or consent of the instructor.

**560. Resources for Effective Reading Programs. 4 Hours.** Analysis of curriculum materials, instructional decision-making processes, and organization of instructional time for effective school-based reading programs; role of reading specialists in school change. Prerequisites: CIE 460 and either ED 430 or 431.

**563. Analysis of Research Literature in Reading. 4 Hours.** Critical analysis of issues in reading and reading instruction with reference to research. A research project is developed. Prerequisites: Ed 490 and CIE 460.

**564. Language Foundations of Reading Behavior. 4 Hours.** Analysis of language-based models of reading behavior; language development and reading; complexity of written prose. Stress on reading development of both monolingual and bilingual pupils. Prerequisite: One graduate course in linguistics or one graduate course in reading.

**565. Diagnostic and Remedial Reading Instruction I. 4 Hours.** Theoretical and practical issues concerning the etiology of reading problems and clinical diagnostic techniques. Two reading-disabled children are diagnosed in the practicum component. Prerequisite: CIE 460 or consent of the instructor.

**566. Diagnostic and Remedial Reading Instruction II. 4 Hours.** Second course of two-course sequence with CIE 565. Emphasizes issues in remedial reading instruction. Practicum involves tutoring a reading disabled client in the UIC Reading Clinic. Prerequisite: CIE 565.

**567. Guiding the School Reading Program. 4 Hours.** Theories and practices influencing the role of the reading specialist supervisor including management and evaluation of support systems, programs, personnel, and inservice instruction in reading. Prerequisites: Ed 430 or 431, and CIE 460.

**568. Themes and Issues in Children's Literature. 4 Hours.** Exploration of themes and current issues related to children's literature from preschool through grade 12. Emphasis on critical analysis relevant to instruction. Prerequisite: One course in children's literature or consent of the instructor.

**569. Practicum in Reading Research. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Independent work under faculty supervision in conducting and reporting a research project in reading/literacy. Prerequisites: Ed 490 and CIE 566.

**570. Critical Issues in Science Education. 4 Hours.** Explores the nature of scientific activity and educational issues, such as constructivism, discourse, gender and multicultural issues, assessment, the role of technology, and teacher research. Prerequisite: Admission to a graduate program in the College of Education or consent of the instructor.

**571. Integrating Mathematics, Science, and ESL. 4 Hours.** Curriculum and instructional issues and practice related to the integration of mathematics, science, and English as a Second Language development. Prerequisite: CIE 481 or consent of the instructor.

**572. Assessment in Science and Math Education. 4 Hours.** Explores different purposes of assessment, generates principles to guide assessment, studies "new" assessment practices, and explores ways to implement them in science and mathematics classes. Prerequisite: Admission to graduate study in education or consent of the instructor.

**574. Foundations of Curriculum Design. 4 Hours.** Curriculum as area of inquiry; historical, philosophical, cultural, and related foundations; variations on curriculum theory and practice; alternative paradigms of curriculum inquiry. Prerequisite: ED 430, or admission to the PhD in education program or the PhD in public policy analysis program.

**575. Seminar in Linguistic Minority Research. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Selected topics on research in the education of language minority students for advanced MEd and PhD students. Topics vary each semester. Prerequisite: CIE 481.

**576. Conceptions of Teaching and Schooling. 4 Hours.** Philosophical and conceptual analysis of teaching and schooling and the impact of those conceptions on the conduct of educational practice. Prerequisite: CIE 574 or consent of the instructor.

**578. Advanced Studies in Qualitative Research Methods. 4 Hours.** The dynamics of data collection and analysis, the use of theory and interdisciplinary frameworks, and writing up and presenting original research. Prerequisite: Ed 502.

**580. Colloquium on Literacy. 1 Hour.** May be repeated for 12 hours of credit. S/U grade only. Various areas of reading, writing, and literacy including research on learning, instruction, and use. Prerequisites: Enrollment in a graduate specialization in reading and consent of the instructor.



**581. Research on Reading Comprehension Instruction. 4 Hours.** Review of issues related to the nature and instruction of reading comprehension, and analysis of instructional research. Prerequisite: CIE 563 or the equivalent.

**583. Research on Beginning Literacy. 4 Hours.** Analysis of theories and research concerning the initial steps in young children's acquisition of reading and writing ability with emphasis on instruction. Prerequisites: CIE 460 and consent of the instructor.

**585. Seminar in Reading Studies. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Selected topics in reading education and research for advanced MEd and PhD students. Topics vary each semester. Prerequisite: CIE 563 or the equivalent, or consent of the instructor.

**586. Research in Elementary Writing. 4 Hours.** Research and theory in elementary writing and spelling development. Analysis of cognitive, developmental and pedagogical aspects of children's writing development. Prerequisites: CIE 460 and consent of the instructor.

**587. Issues in the Measurement of Reading Ability. 4 Hours.** Theory and practice in reading measurement. Measurement issues unique to reading assessment, including measurement of vocabulary, word recognition, readiness, comprehension, and functional literacy. Prerequisites: CIE 460 and EPsy 546.

**590. Alternative Paradigms of Qualitative Research in Education. 4 Hours.** Methodology, cases, and rationale for action research, educational criticism, critical ethnography, historiography, and phenomenological hermeneutics as alternatives in qualitative research in education. Prerequisites: CIE 578 or consent of the instructor, and admission to the PhD in education program or the PhD in public policy analysis program.

**593. PhD Research Project. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the PhD in Education program.

**594. Special Topics in Curriculum, Instruction, and Evaluation. 2 to 4 Hours.** May be repeated for up to 12 hours of credit. Students may register for more than one section per term. Seminar on a preannounced topic focusing on methodology, research and educational implications of recent models of learning, problem solving and thinking. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Students design, implement and analyze the results of a research problem in this area of specialization. Prerequisite: Consent of the study advisor.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student's dissertation. Prerequisite: Consent of the dissertation advisor.

## **Disability and Human Development (DHD)**

**401. Foundations of Disability and Human Development. 3 Hours.** A critical review of key concepts and issues in disability. Students will develop a framework for understanding disability as a multi-level entity, including the impact of disability at personal, social, and societal levels. Prerequisite: Enrollment in the MS in disability and human development program or consent of the instructor.

**415. Concepts in Interdisciplinary Research on Disability. 3 Hours.** Core methodological skills and concepts of interdisciplinary approaches to disability research. Topics include traditions of inquiry, problem formulation, research designs, and research report writing. Prerequisite: DHD 401 or consent of the instructor.

**420. Family Perspectives on Disability. 3 Hours.** Same as Community Health Sciences 421 and Disability Studies 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

**430. Introduction to Disability Policy and Organization. 3 Hours.** Legislative, legal, and administrative foundations for the provision of services to persons with disabilities in the U.S. Roles of residential institutions, the independent living movement, class action litigation and advocacy. Prerequisite: DHD 401 or consent of the instructor.

**440. Introduction to Assistive Technology: Principles and Practice. 3 Hours.** Underlying principles and exemplary practice of assistive technology used by individuals with disabilities, including augmentative communication, seating, mobility, computer access, environmental control, home modifications, and worksite modifications.

**441. Adaptive Equipment Design and Fabrication. 3 Hours.** Examination of the interaction between design and disability issues through comparison of appropriate design theories, materials, and work with consumers. Some assignments will involve field work. Prerequisites: Graduate standing, or DHD 440 and consent of the instructor.

**442. Seating and Wheeled Mobility. 3 Hours.** Issues of wheelchair seating, positioning and mobility for children and adults with physical disabilities. Assessment procedures, technology selection, and analysis of funding sources. Prerequisite: DHD 440 or consent of the instructor.

**446. Qualitative Methods in Disability Research. 3 Hours.** Comparisons of qualitative and quantitative approaches to research, presentation of commonly used methods, issues of analysis and interpretation, and the use of participatory research methods.

**464. Survey of Developmental Disabilities. 3 Hours.** Same as CHSc 464. Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research.

**494. Special Topics in Disability and Human Development. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Systematic study of selected topics in disability and human development.

**514. Ethical Issues in Disability. 3 Hours.** Examines contemporary ethical issues affecting the lives of persons with disabilities and disability professionals. Critiques the application of ethical principles to problems of genetics, treatment decisions, and competency.

**515. Statistical Methods in Disability Studies. 3 Hours.** Same as Dis 515. Examination of parametric and non-parametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. Prerequisite: An introductory course in statistics.

**520. Disability and Physical Activity. 3 Hours.** Same as Kine 540. Examination of the foundations of physical activity for persons with disabilities. Emphasis on strategies for promoting physical activity among persons with disabilities in community settings.

**532. Community Intervention. 3 Hours.** Same as Psch 532. Theory, research, and practice of community interventions in public, nonprofit and voluntary settings, e.g., disability organizations; intervention types and effectiveness; role of community intervenor. Prerequisite: Consent of the instructor.

**535. Advocacy and Empowerment in Disability. 3 Hours.** Same as Dis 535. In-depth review of academic literature on advocacy and empowerment. Relevant theories, research, and interventions in the context of individuals with disabilities will be reviewed.

**537. Disability and Health Promotion. 3 Hours.** Examines health issues in disability with emphasis on health promotion and preventing secondary disease. Relationship of emerging theories of health promotion to disability are discussed.

**541. Advanced Concepts in Disability Research. 3 Hours.** Same as Dis 541. Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews.

**551. Computers, Communication, and Controls in Rehabilitation Technology. 3 Hours.** Same as OT 551. Assistive technology course exploring different methods for evaluating controls used to operate computers, communication devices, and powered wheelchairs. Instruction also addresses device features and integration factors.

**552. Achieving Functional Mobility Through Assistive Technology Intervention. 3 Hours.** Assessment procedures, identifying appropriate technology, and customization to address functional mobility in children and adults through use of assistive technology. Prerequisite: DHD 440.

**554. Augmentative Communication Assessment. 3 Hours.** Augmentative communication assessment strategies and

evaluation of materials development. Utilizes case examples for discussion of specific approaches for different ages, disabilities, and settings. Prerequisite: DHD 440.

**564. Community Integration in Developmental Disabilities. 3 Hours.** Same as CHSc 564 and Dis 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

**565. Research Approaches in Rehabilitation Technology Use and Delivery. 3 Hours.** Same as Dis 565 and OT 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, worksite and community.

**570. Disability and Culture. 3 Hours.** Development of a cultural comparative approach in disability studies; American and cross-cultural aspects of disability; imagery of disability; disability and the body; gender and life-course issues, cultures of disability. Prerequisite: DHD 401 or consent of the instructor.

**572. A Representational History of Disability. 4 Hours.** Same as Dis 572. Examines historical and contemporary representations of “the body” to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to “aberrant bodies.”

**575. History of Human Differences: Disability Minorities in America. 3 Hours.** Historical experiences of disability minorities during the modern era. Focus on American experiences and comparing them to premodern and contemporaneous experiences in Western European societies. Prerequisite: DHD 401 or consent of the instructor.

**576. Visualizing the Body. 4 Hours.** Same as Dis 576. Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history.

**590. Field Experience in Disability and Human Development. 0 to 12 Hours.** May be repeated for a maximum of 12 hours of credit. Opportunities for guided experience working with agencies, families, and persons with disabilities providing concrete, practical applications of concepts and principles of disability and human development. Prerequisites: DHD 401 and 415 or consent of the instructor.

**593. Independent Research. 1 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisite: Consent of the instructor.

**594. Advanced Special Topics in Disability and Human Development. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced selected topics in disability and human development.

**595. Seminar in Disability and Human Development. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Identifies and analyzes a broad range of issues related to disability and human development. Topics vary according to student interests and instructor availability. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of a topic under the guidance of a faculty member. Prerequisite: Consent of the instructor.

**597. Project Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research project under the supervision of a faculty member. Prerequisites: Graduate standing in the MS in disability and human development program and consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Thesis research to fulfill master's degree requirements. Prerequisites: Graduate standing in the MS in disability and human development program and consent of the instructor.

## Disability Studies (Dis)

**420. Family Perspectives on Disability. 3 Hours.** Same as CHSc 421 and DHD 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

**447. Ethnographic Research in Health and Human Services I. 4 Hours.** Same as OT 447. Course for practitioners and

researchers who are not well-versed in ethnography. Details strategies for conducting ethnographic research in health and human service contexts. Prerequisite: Consent of the instructor.

**501. Disability Studies I. 4 Hours.** Provides analysis of contemporary classification and diagnosis systems for disability as well as the conceptual foundations for disability studies as a content area.

**502. Disability Studies II. 4 Hours.** Current approaches and practices in disability studies, critically considered from a variety of perspectives. Service delivery systems and the influence that civil rights and self determination have had. Prerequisite: Dis 501.

**515. Statistical Methods in Disability Studies. 3 Hours.** Same as DHD 515. Examination of parametric and nonparametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. Prerequisite: Introductory course in statistics.

**535. Advocacy and Empowerment in Disability. 3 Hours.** Same as DHD 535. In-depth review of academic literature on advocacy and empowerment. Relevant theories, research, and interventions in the context of individuals with disabilities will be reviewed.

**541. Advanced Concepts in Disability Research. 3 Hours.** Same as DHD 541. Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews.

**547. Ethnographic Research in Health and Human Services II. 4 Hours.** Same as OT 547. Provides faculty supervision and peer criticism for students at various stages of proposing and conducting ethnographic research in health and human service contexts. Prerequisite: Dis 447.

**550. Disability in the Urban Environment. 4 Hours.** Same as OT 550. Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities.

**560. Dilemmas in Disability Services. 4 Hours.** Same as OT 560. The complexities inherent in the delivery of therapeutic and related services to persons with disabilities including personal attributes, interpersonal, and contextual components.

**562. Perception-Action Processes in Development and Disability. 4 Hours.** Same as OT 562. Implications of developmental theory for treatment of disabilities. Special emphasis on perception-action systems and the acquisition of skill.

**564. Community Integration in Developmental Disabilities. 3 Hours.** Same as CHSc 564 and DHD 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

**565. Research Approaches in Rehabilitation Technology Use and Delivery. 3 Hours.** Same as DHD 565 and OT 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, work site and community.

**566. Narrative and the Phenomenology of Disability. 4 Hours.** Same as OT 566. Open to master's and PhD students in social sciences, medicine, nursing, social work, education, and related health professions. Recent interdisciplinary studies of narrative as they pertain to chronic illness and disability.

**572. A Representational History of Disability. 4 Hours.** Same as DHD 572. Examines historical and contemporary representations of “the body” to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to “aberrant bodies.”

**576. Visualizing the Body. 4 Hours.** Same as DHD 576. Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history.

**589. Current Research in Disability Studies. 1 Hour.** May be repeated for a maximum of 10 hours of credit. S/U grade only. A review of the current primary source literature in the area of disability research. Prerequisite: Consent of the instructor.

**590. Research Project in Disability Studies. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. S/U grade only. Formal

research project for students not having prior research experience. Prerequisite: Consent of the instructor.

**593. Independent Research in Disability Studies. 1 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisite: Consent of the instructor.

**594. Special Topics in Disability Studies. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced selected topics in disability studies. Prerequisite: Consent of the instructor.

**595. Interdisciplinary Seminar in Disability Studies. 1 Hour.** May be repeated for a maximum of 4 hours of credit. S/U grade only. Students, faculty, and guest speakers present topics addressing current issues in research in the area of disability studies. Prerequisite: Consent of the faculty adviser.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of a topic under the guidance of a faculty member. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research in one area of disability studies. Prerequisites: Graduate standing in the PhD in Disability Studies Program and consent of the instructor.

## Doctor of Arts (DA)

**502. Analysis of Content for Instruction. 4 Hours.** Same as EPsy 554. Psychological factors influencing the analysis of content for the development of procedures, materials and systems for instruction in subject matter disciplines. Prerequisite: Consent of the instructor.

**504. Instructional Design. 4 Hours.** Same as EPsy 555. Principles and practice in instructional development, including design models for various content outcomes, student and media characteristics; formative evaluation of materials. Prerequisite: Credit or concurrent registration in DA 502.

**505. Theory and Development of Instructional Microcomputing. 4 Hours.** Same as EPsy 556. Analysis of instructional applications of microcomputing; emphasis upon theory of courseware design, development, and implementation; courseware selection and management factors in instructional settings. Prerequisite: DA 504 or consent of the instructor.

**506. Instructional Technology. 4 Hours.** Same as EPsy 557. Training and laboratory work in computer-assisted instruction, audiovisual media, interactive video; development and implementation costs; problems of integrating instructional technology into educational systems. Prerequisite: DA 504 or consent of the instructor.

## Earth and Environmental Sciences (EaES)

**400. Field Experience in Earth Sciences. 6 Hours.** Application of geologic mapping and other field techniques to a summer field camp in the Black Hills of South Dakota for a period of six weeks. Prerequisites: EaES 330 and 440 or consent of the instructor.

**410. Geochemistry. 4 Hours.** Origin of elements. Principles of the distribution of elements in the earth's crust. Element partitioning between coexisting minerals. Thermodynamic considerations of mineral equilibria. Geochemistry of continental waters. Ocean geochemistry. Prerequisite: Chem 114 or consent of the instructor.

**415. Environmental Geochemistry. 4 Hours.** Chemical reactions in natural environments; surface chemistry of metals and organic compounds. Clay minerals in soils and sediments. Chemistry of contaminant remediation. Prerequisite: EaES 310 or consent of the instructor.

**416. Organic Geochemistry. 4 Hours.** Global carbon cycle, chemical composition of biogenic matter, sedimentology and diagenesis of organic matter, molecular fossils, geopolymers, fossil fuels, anthropogenic organic compounds, carbon isotope geochemistry. Prerequisite: Chem 114 or Chem 130, and EaES 350; or consent of the instructor.

**422. Crystal Chemistry of Rock-Forming Minerals. 4 Hours.** The crystal chemistry, chemistry, phase equilibria, and properties of materials and minerals. Prerequisite: EaES 220 or consent of the instructor.

**424. X-ray Crystallography. 4 Hours.** Introduction to the use of diffraction techniques for the identification and characterization of minerals. Prerequisite: Consent of the instructor.

**430. Igneous Petrology. 4 Hours.** Discussion of petrogenesis, application of thermodynamic principles to the crystallization of rocks. Prerequisites: Chem 114 and EaES 330.

**440. Structural Geology and Tectonics. 4 Hours.** Elementary stress and strain relations; folds, fabrics and faults; deformation mechanisms; basic plate tectonic concepts with regional geological examples. Required weekend field trip at a nominal fee. Prerequisites: EaES 102, Math 180, and either Phys 101 or 141; or consent of the instructor.

**444. Geophysics. 4 Hours.** Introduction to basic principles of geophysics applicable for environmental problems and the solid earth including magnetics, electric, seismic, gravity, geophysical well logging, radioactivity and heat flow. Prerequisites: EaES 440, Math 181, and either Phys 102 or 142; or consent of the instructor.

**448. Plate Tectonics. 4 Hours.** Basic concepts and recent developments including plate kinematics, marine magnetism and paleomagnetism, evolution of oceanic lithosphere, subduction zones and passive margins. Prerequisites: Math 180, and either Phys 102 or 142; or consent of the instructor.

**455. Stratigraphy. 4 Hours.** Stratigraphic patterns in the geological record; eustatic, isostatic, and tectonic controls of stratigraphic sequences; cyclicity in stratigraphy; seismic, sequence, magnetic and chronostratigraphic principles and techniques. Prerequisite: EaES 350.

**466. Principles of Paleontology. 4 Hours.** Same as BioS 466. Theory and methods of evolutionary paleobiology; includes paleoecology, functional morphology, and major features of organic evolution. Prerequisite: EaES 360 or consent of the instructor.

**468. Vertebrate Paleontology. 5 Hours.** Same as BioS 468. Evolution, morphology and paleoecology of the fossil vertebrates. Prerequisites: One year of biological sciences or earth and environmental sciences, and consent of the instructor.

**470. Surficial Processes. 4 Hours.** Quantitative analysis of the mechanics, rates, and distribution of physical processes that modify Earth's and other planets' surfaces. Introduction to field, theoretical, and modelling approaches. Prerequisites: EaES 101 and Math 181.

**475. Hydrology/Hydrogeology. 4 Hours.** Field trip required at a nominal fee. The occurrence, storage, movement, and quality of water above, on and below the Earth's surface. Topics progress through atmospheric water vapor processes, Earth surface hydrology, and groundwater hydrology. Prerequisite: EaES 101 or EaES 107 and Math 181, or consent of the instructor.

**480. Statistical Methods in Earth and Environmental Sciences. 4 Hours.** Techniques of probability and data analysis as applied to problems in environmental sciences. Sampling, statistical inference, descriptive statistics, multivariate methods, time series analysis. Prerequisite: Consent of the instructor.

**488. Instrumental Analysis. 3 Hours.** Scanning electron microscopy with energy-dispersive system. DC plasma analysis. Prerequisites: Chem 114 and EaES 220 or consent of the instructor.

**492. Internship in the Earth and Environmental Sciences. 1 Hour.** May be repeated for credit with the approval of the department. A combined maximum of 6 hours of credit in Earth and Environmental Sciences 492 and 396 may be applied toward the degree. Satisfactory/Unsatisfactory grade only. Off-campus participation in governmental or private-sector training program. Credit is contingent on submission of a final report. Prerequisite: EaES 350.

**494. Current Topics in Earth and Environmental Sciences. 4 Hours.** Discussion of current research topics in earth and environmental sciences. Prerequisites: Consent of the instructor. Twelve hours of advanced courses in earth and environmental sciences are recommended.

**510. Advanced Geochemistry. 3 to 4 Hours.** May be repeated for credit if the same subject is not covered twice. Advanced topics in one of the following categories: isotope geochemistry and geochronology, distribution of elements in the earth's crust, mineral systems with and without volatile components, low-temperature mineral systems. Lectures and seminars. Prerequisites: Consent of the instructor. Credit in EaES 410 is recommended.

**516. Advanced Organic Geochemistry/Biochemistry. 4 Hours.** Carbon biogeochemical cycle, carbon fixation and carbon



isotope fractionation, compound specific isotope analysis, biomarker geochemistry, paleoenvironment. Prerequisite: EaES 416 or consent of the instructor.

**520. Advanced Mineralogy. 4 Hours.** May be repeated if the same topic is not covered twice. Various types in one of the following categories: structural determination, advanced diffraction techniques, crystal chemistry and structural mineralogy. Lectures, seminars, and laboratory. Prerequisite: Consent of the instructor.

**530. Advanced Petrology. 3 to 4 Hours.** May be repeated for credit if topic is different for each registration. Selected topics: generation and properties of magmas, formation of metamorphic rocks, reaction rates in metamorphic rocks. Prerequisite: Consent of the instructor. Credit in EaES 430 is recommended.

**541. Seismology. 4 Hours.** Elastic wave propagation theory, instrumentation, seismic source mechanisms, body and surface waves, free oscillations, earth's interior, focal mechanisms, earthquakes and plate tectonics. Prerequisite: EaES 444 or consent of the instructor.

**543. Advanced Geophysics and Plate Tectonics. 4 Hours.** May be repeated for credit if topic is different for each registration. Students may register for more than one section per term. Advanced topics in geophysics and plate tectonics including subjects such as mantle convection, driving forces of plate tectonics and evolution of rifted continental margins. Prerequisites: EaES 444 or EaES 448.

**560. Topics in Paleontology. 3 to 4 Hours.** Same as BioS 560. May be repeated for credit if topic is different for each registration. In-depth analysis of current problems and issues in paleontology, involving reading primary literature, student presentations, and critical discussions. Prerequisite: Consent of the instructor.

**570. Advanced Surficial Processes. 4 Hours.** May be repeated for credit if topic is different for each registration. Advanced topics in theoretical, empirical, and applied aspects of hillslope processes, sediment transport mechanics, river mechanics, weathering and soil development, or drainage basin development. Prerequisite: EaES 470.

**572. Quaternary Environmental Systems. 3 Hours.** Interrelations between eolian, lacustrine, marine, eolian and glacial environments for the past 1.8 million years; geochronologic and isotopic methods; stratigraphic and geomorphic approaches. Prerequisites: Graduate standing and EaES 470.

**575. Advanced Groundwater Hydrology. 4 Hours.** May be repeated for credit if topic is different for each registration. Selective topics; mechanics of near surface groundwater, flow in fractured rocks, groundwater contamination, unsaturated-saturated flow, surface-groundwater interactions. Prerequisite: EaES 475.

**576. Paleoclimatology. 3 Hours.** Principles of climatology and paleoclimatology; mechanisms and causes of climate change for the past 63 million years; geologic records of climate and modelling. Prerequisite: EaES 470.

**584. Marine Geology. 4 Hours.** Marine topography, tectonics, and sedimentology; continental margins and submarine canyons; abyssal plains and hills; mid-ocean ridges and transform faults; trenches, island arcs, and back-arc basins. Prerequisite: Consent of the instructor.

**595. Departmental Seminar. 1 Hour.** S/U grade only. Special one-hour seminar, every Thursday, by invited speakers from other earth and environmental sciences departments, governmental agencies, and industry.

**596. Advanced Studies in Earth and Environmental Sciences. 1 to 6 Hours.** May be repeated for credit. A maximum of 4 hours of credit may be applied towards the requirements for the MS degree. Independent study or research with faculty supervision, leading to a written report. Prerequisites: Consent of the head of the department and the faculty member who will supervise the study.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual work under the supervision of faculty members in their respective fields. Prerequisite: Consent of the thesis supervisor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual work under the supervision of faculty members in their respective fields. Prerequisite: Consent of the thesis supervisor.

## Economics (Econ)

**436. Mathematical Economics. 4 Hours.** Application of mathematics to theories of consumer and producer behavior, determination of prices in markets, growth and stability features of macroeconomic models. Prerequisites: Econ 218 or 220; and either Econ 345 or Math 165 or 180.

**441. Teaching Methods in Economics. 4 Hours.** Credit earned in Econ 441 may not be used to satisfy Economics credit requirements for the MA or PhD degrees given by the Department of Economics. Credit earned in Econ 441 may be applied toward the degree as an elective. Develops skills in preparing and giving lectures and examinations, computer usage and other aspects of teaching economics and consumer economics at secondary/higher education levels. Prerequisite: one course in graduate-level microeconomics or macroeconomics.

**450. Business Forecasting Using Time Series Methods. 4 Hours.** Same as IDS 476. Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multivariable transfer function models is also included. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

**472. Real Estate Finance. 3 Hours.** Same as Fin 472. Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. Prerequisite: Fin 300.

**495. Competitive Strategy. 4 Hours.** Multidisciplinary analysis of organizational strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

**499. Independent Study in Economics. 1 to 3 Hours.** Independent study of a topic not covered in a graduate-level course. Prerequisites: Consent of the Director of Graduate Studies and the instructor.

**500. Managerial Economics. 4 Hours.** Economic analysis applied to business operations; demand theory; production cost analysis; capital theory; pricing policies; capital budgeting. Prerequisite: Econ 501 or 520.

**501. Microeconomics I. 4 Hours.** Theories of consumer and producer behavior and determination of market price. Systematic treatment of the core of microeconomic theory. Prerequisites: Econ 220 and Math 165.

**502. Microeconomics II. 4 Hours.** Advanced microeconomic theory. Theories of consumer behavior, uncertainty, general equilibrium, welfare economics. Prerequisite: Econ 501.

**504. The Economics of Organization of Business Enterprises. 4 Hours.** The economic reasons for the existence of firms, the determinants of firm size and the theory of organizational structure. Prerequisite: Econ 501 or Econ 520.

**511. Macroeconomics I. 4 Hours.** Static and dynamic theories of income, employment and the price level; advanced treatment of consumption, investment, money demand and aggregate production functions; stabilization theory and policy. Prerequisite: Econ 221.

**512. Macroeconomics II. 4 Hours.** Neoclassical and modern market-clearing models of real and monetary influences on economic growth, inflation and business cycles. Prerequisite: Econ 511.

**513. Special Topics in Macroeconomics and International Economics. 4 Hours.** Intense study of selected research topics in macroeconomics and international economics. Topics may vary. Prerequisite: Econ 512.

**514. International Trade Policy. 4 Hours.** Analysis of effects of tariff and nontariff policy on flow of trade and distribution of income within and between countries; policy implications of factor price equalization; stability conditions for balance of payments equilibrium. Prerequisite: Econ 501 or Econ 520 or Econ 521.

**515. International Monetary Policy. 4 Hours.** Capital mobility and stabilization policy under fixed and flexible exchange rates; optimum currency areas; reform of international monetary system; problems of liquidity adjustment and confidence. Prerequisite: Econ 511 or 521.

**516. Economic Development in an Interdependent World. 4 Hours.** Theoretical and empirical studies of economic development with intersectoral and international perspectives; structural



change and resource reallocation; factor proportions, substitutability, and movement; export-led growth. Prerequisite: Econ 501 or 520 or consent of the instructor.

**520. Microeconomics for Business Decisions. 4 Hours.**

Credit is not given for Econ 520 if the student has credit in Econ 501 or 540 or MBA 502. Efficient allocation of resources by consumers, profit and nonprofit firms and government, regulation of industry, monopoly and imperfect competition, business ethics and the market place, efficiency vs. equity, social welfare. Prerequisite: Math 165 or 181 or the equivalent.

**521. Macro and International Economics for Business. 4 Hours.**

Credit is not given for Econ 521 if the student has credit in Econ 511 or MBA 502 and 508. Impact of the macro economy and international economics on business decisions. Determination of economic activity, inflation, interest rates and exchange rates. Role of monetary and fiscal policy.

**531. Labor Economics I. 4 Hours.** Determinants of wage differentials; analysis of determinants and consequences of investments in human capital (schooling, on-the-job training, health); labor mobility, supply and allocation of time. Prerequisite: Econ 501 or 520.

**532. Labor Economics II. 4 Hours.** Impact of training, legislation, institutional constraints, and discrimination on the labor market. Focus on demographic groups (race, nativity, ethnicity, gender). Prerequisite: Econ 501 or 520.

**533. Economic Development and Human Resources. 4 Hours.** Economic theory applied to less developed countries, focusing on human aspects of development. Household economy, employment, earnings; labor productivity, unemployment; migration, population growth, income distribution. Prerequisite: Econ 501 or 520.

**534. Econometrics I. 4 Hours.** Detailed treatment of the multivariate linear regression model using matrix algebra. Emphasis on formulating and testing static and dynamic econometric models. Prerequisite: Econ 445 or IDS 532.

**535. Econometrics II. 4 Hours.** Detailed treatment of simultaneous equations estimation; evaluation of alternative estimators; problems of estimation including PROBIT, LOGIT, TOBIT, and Error Component Models. Prerequisite: Econ 534.

**536. Advanced Mathematical Economics. 4 Hours.**

Mathematics theory and applications, including calculus and linear algebra, to theories of consumer and producer behavior, general equilibrium, welfare economics, externalities, and social choice. Prerequisite: Math 181.

**537. Business Research and Forecasting I. 4 Hours.**

Same as IDS 582. The role of research in business; forecasting methods and techniques, including models and their applications. Prerequisites: Econ 534. and at least one statistics course with regression analysis at the 300-level or above.

**538. Business Research and Forecasting II. 4 Hours.**

Same as IDS 583. The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. Prerequisite: IDS 476 or IDS 582.

**540. Economics for the Social Sciences. 4 Hours.** Same as PPA 540. Credit is not given for Econ 540 if the student has credit in Econ 501 or 520. Introduction to economics for graduate students in the social sciences. Economic cost, incentives, resource allocation and economic institutions. Supply and demand analysis. Economic behavior of consumers and households, business firms, government and not-for profit institutions.

**551. Economics of Education. 4 Hours.** Basic concepts and tools of economics applied to education. Economic implications of educational outcomes for the economy, and for socio-economic structure (e.g., income distribution, fertility patterns, ethnic group differences). Prerequisite: Econ 501 or 520.

**552. Economic Demography. 4 Hours.** Economic analysis of fertility (number and timing of children), mortality, marriage and divorce, population age structure, the relationship between population growth and economic development. Prerequisite: Econ 501 or 520.

**555. Advanced Health Economics. 4 Hours.** Same as HPA 543. Topics in the supply and demand for health services; the role of insurance in the medical care industry; public policy issues of cost and quality regulation. Prerequisite: Econ 501 or 520 or consent of the instructor.

**560. Industrial Organization. 4 Hours.** Analysis of industry

structure, behavior and performance; firms in imperfect competition; concentration measurement; oligopoly theory; cartels; price discrimination; vertical and horizontal integration. Prerequisite: Econ 501 or 520 or consent of the instructor.

**570. Environmental and Natural Resource Economics. 4 Hours.**

Analytical methods for evaluating the impacts and control costs of pollution externalities and natural resource changes. Consequent implications for public and business policy. Prerequisite: Econ 501 or Econ 520.

**571. Urban Real Estate and Land Economics. 4 Hours.**

Economic analysis of urban real estate and land. Real estate appraisal. Demand for urban land; supply of land and improvements. Prerequisite: Econ 501 or 520.

**572. Urban Economics. 4 Hours.** Urban economic models and economic analysis of urban problems. Firm location, housing, transportation, local public finance. Prerequisite: Econ 501 or 520.

**574. Comparative Urbanization. 4 Hours.** Process of urbanization in different economic and social contexts. Urban growth, primacy, city size, distribution, urban hierarchy, core and periphery. Relationship with economic development. Prerequisite: Econ 501 or 520 or consent of the instructor.

**575. Economic Analysis of Public Expenditures. 4 Hours.**

Microeconomic theory as applied to public expenditure decisions; externalities, shadow prices and investment criteria in cost-benefit analysis; uncertainty and the value of life; extensive illustrative case studies. Prerequisite: Econ 501 or 520.

**576. Economics of Taxation. 4 Hours.** Analysis of the effects of taxation on economic behavior; taxation and public choice; the effects of taxation on the distribution of income; theory and empirical analysis of welfare effects of taxes; optimal tax theory; issues in tax policy and tax reform. Prerequisite: Econ 501 or 520.

**592. Workshop in Economics. 4 Hours.** Bridges the transition from coursework to dissertation research. The nature of a PhD dissertation, topic selection, career design, research support networks. Students define a potential dissertation topic, survey the literature, and present it in class. Prerequisite: Comprehensive exams in micro and macro.

**593. Internship Program. 0 to 8 Hours.** Under the direction of a faculty supervisor, students work in government or a private firm on problems related to their major field of interest. Specific credit allotted is determined by the Graduate Curriculum Committee after receiving the supervisor's recommendation. Prerequisites: Completion of the core courses in the degree program in which the student is enrolled and approval of the internship program by the graduate adviser and the Graduate Curriculum Committee.

**596. Independent Study. 1 to 4 Hours.** Independent study under faculty supervision. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on MA thesis. Prerequisite: Consent of the chair of the thesis committee.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on a PhD thesis. Prerequisite: Consent of the chair of the thesis committee.

## Education (Ed)

**402. Philosophy of Education and Urban School Policy. 3 Hours.** Selected social and education philosophies and their impact on urban school curriculum design, school organization, and control.

**403. Policy Issues in the History of American Education. 3 Hours.** Political, economic, and cultural influences shaping the development of American education policy; emphasis on issues of education theory and practice in their historical settings.

**421. Advanced Educational Psychology. 3 Hours.**

Examines current theory and research on the teaching-learning process with particular attention to general learning and curriculum-relevant problem-solving skills.

**422. Advanced Developmental Psychology and Educational Processes. 3 Hours.**

Same as Psch 422. Focuses on cognitive and social development from birth to adolescence. Examines relations between development, learning, and educational processes. Prerequisites: Psch 100 and any one from Ed 210, Psch 259,

Psch 320; or consent of the instructor.

**430. Curriculum, Instruction, and Evaluation in Education. 3 Hours.** Introduction to curriculum, instruction, and evaluation as areas of inquiry; implications of these areas of inquiry for educational practice; related contemporary problems and issues. Prerequisite: Admission to graduate study in education or consent of the instructor.

**431. Improving Learning Environments. 3 Hours.** Analysis of structural, normative, and social dimensions of learning environments and their relationships to student learning. Exploration of change processes to improve those environments.

**432. Instruction and Evaluation in Secondary Education. 5 Hours.** Instructional planning and curriculum design; strategies for instruction and classroom management; forms of formative and summative evaluation; and professional development issues. Field experience required. Prerequisites: Completion of education core courses in the undergraduate teacher certification program; Ed 200 and 210 or, in the graduate teacher certification program, Ed 402 or 403 or PS 401; and Ed 421 or 422 or 445.

**445. Adolescence and the Schools. 3 Hours.** Physiological, intellectual, and social development of adolescence. Relations between aspects of adolescent development and the academic and social demands of secondary schools.

**461. Political and Socio-Cultural Perspectives on Special Education. 3 Hours.** Same as SpEd 461. Students will examine issues of access and equity through legislation, litigation, and socio-cultural perspectives and be introduced to major theoretical frameworks that influence special education programs. Field work required.

**470. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the college. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the college or department of specialization.

**471. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the college. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Ed 470, and approval of the college or department of specialization.

**472. Promoting Academic and Prosocial Behavior I. 3 Hours.** Same as SpEd 472. Explores the importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. Field work required. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**473. Teaching Math and Science with Adaptations. 3 Hours.** Same as SpEd 473. Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. Field work required. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**490. Introduction to Research Design in Education. 3 Hours.** Introduction to educational research design and literature. Emphasis is placed on learning the fundamental techniques of social science inquiry as they apply to educational issues.

**500. Philosophical Foundations of Educational Inquiry. 4 Hours.** Philosophical foundations of various forms of educational inquiry. Epistemological and ethical dimensions of different research approaches. Prerequisites: Admission to the PhD in Education program or consent of the instructor.

**501. Data and Interpretation in Educational Inquiry. 4 Hours.** Data, interpretation, reliability, validity, accuracy, stability, and generalizability from different methodological perspectives; how research design, data collection, and interpretation vary with different philosophical approaches. Prerequisite: Admission to the PhD in education program or consent of the instructor.

**502. Essentials of Qualitative Inquiry in Education. 4 Hours.** Hands-on introduction to qualitative research methods, including foundations, practices, and ethics in qualitative research.

Prerequisite: Admission to the PhD in education program or consent of the instructor.

**503. Essentials of Quantitative Inquiry in Education. 4 Hours.** Same as EPsy 503. Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). Prerequisite: Admission to the PhD in education program or consent of the instructor.

**543. Research on Teaching. 4 Hours.** Review and analysis of history, paradigms, methods, and findings of research on teaching. Focus on the development of research questions and strategy. Prerequisites: Ed 490 or 503 or CIE 578, and consent of the instructor.

**544. Research Designs for Policy Analysis. 4 Hours.** Same as PPA 544. Alternative research design models and program evaluation methodologies; quantitative and qualitative approaches; ethnography and historiography; experimentation and quasiexperimentation; causal modeling. Prerequisites: Admission to the PhD program in public policy analysis and one graduate-level course in statistics.

**596. Independent Study. 1 to 4 Hours.** Students may register for more than one section per term. Students independently study related topics not covered by course, under faculty supervision. Prerequisite: Consent of the advisor.

## Educational Psychology (EPsy)

**420. Social Development of Urban Children. 4 Hours.** Same as Psch 420. General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles. Prerequisite: Admission to the graduate program in education or psychology, or consent of the instructor.

**429. Constructivist Approaches to Development: Piaget and Vygotsky. 4 Hours.** Same as Psch 429. Piaget's and Vygotsky theories of development of knowledge. Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language. Prerequisites: Graduate standing in education and Ed 422 or the equivalent, or consent of the instructor.

**446. Characteristics of Early Adolescence. 3 Hours.** Same as Psch 423. Physiological, social, emotional and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. Prerequisite: Admission to the PhD program in psychology; or approval of the College of Education or consent of the instructor, and Ed 210 or 421 or 422.

**449. History and Philosophy of Early Childhood Education. 3 Hours.** Historical and philosophical foundations of early childhood education. Emphasis on the effects of changing economic, political, and social conditions, values and views of human development. Prerequisite: Ed 210 or the equivalent.

**465. Cognitive Development and Disabilities. 3 Hours.** Same as SpEd 465. Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and intervention. Field work required. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**466. Language Development, Diversity, and Disabilities. 3 Hours.** Same as SpEd 466. Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention. Field work required. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**467. Social and Emotional Development and Disabilities. 3 Hours.** Same as SpEd 467. Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5–21 with and without disabilities. Field work required. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**482. Forging Collaborations with Family and Community. 3 Hours.** Same as SpEd 482. Develops skills necessary to work in partnership with the families of children with disabilities, and community members. Prerequisite: Ed 461 or the equivalent or consent of the instructor.

**494. Topics in Educational Psychology. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Seminar on a preannounced topic focusing on methodology, research and educational

implications of recent models of learning, problem solving, and thinking. Prerequisite: Consent of the instructor.

**500. Proseminar in Educational Psychology. 2 Hours.** Same as Psch 550. S/U grade only. Interdisciplinary colloquia on selected topics in educational psychology. Serves as introduction to faculty research foci. Prerequisite: Admission to the PhD in education program or the PhD in psychology program, or consent of the instructor.

**501. Cognition and Instruction. 4 Hours.** Same as Psch 551. Current research on relations among cognitive processes, learning, and instruction. Prerequisite: Admission to the PhD in education program or the PhD in psychology program, or consent of the instructor.

**502. Social Psychology of Education. 4 Hours.** Same as Psch 517. Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. Prerequisite: Admission to the PhD in education program or the PhD in psychology program, or consent of the instructor.

**503. Essentials of Quantitative Inquiry in Education. 4 Hours.** Same as Ed 503. Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). Prerequisite: Admission to the PhD in education program or consent of the instructor.

**519. Curriculum, Instruction, and Assessment in Early Primary Grades. 4 Hours.** Art, literacy, social studies, math, and science in grades kindergarten through third. Provides extensive field experience in primary classrooms. Prerequisites: EPsy 520 and 521; and consent of the instructor.

**520. Curriculum and Practice in Early Childhood Education I. 6 Hours.** Examines curriculum models and methods for fostering learning and development in early childhood. Provides extensive clinical experience in early childhood classrooms. Prerequisites: EPsy 429 and Ed 422.

**521. Curriculum and Practice in Early Childhood Education II. 6 Hours.** Instructional methods and curricula in the preschool classroom. Discussion of program and child evaluation. Includes full-time supervised teaching. Meets eight weeks of the semester. Meets Illinois State requirement for Type 04 Certification by providing supervised student teaching experience. Prerequisites: Credit or concurrent registration in EPsy 520; and consent of the instructor.

**522. Student Teaching in the Primary Grades. 6 Hours.** Instructional methods in curricula in primary grades. Field work required. Meets eight weeks of the semester. Meets Illinois State Board of Education requirement for Type 04 Certification. Prerequisites: EPsy 519 and consent of the instructor.

**524. Parent and Staff Relations in Early Education. 4 Hours.** Methods for involving parents in early childhood programs. The role of the director in program administration and in hiring, training, and supervising teachers and staff. Prerequisite: Consent of the instructor.

**526. Development in Infancy and Early Childhood. 4 Hours.** Same as Psch 520. Consideration of development in the preschool years. Stress on theory, research, individual child study, and educational implications. Prerequisite: Ed 422 or the equivalent.

**527. Seminar in Moral Development, Character Formation, and Education. 4 Hours.** Same as Psch 527. Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. Prerequisite: Ed/Psch 422 or the equivalent, or admission to the PhD program in education, PhD program in psychology, or PhD program in social work, or consent of the instructor.

**529. Cognition and Instruction: Advanced Constructivist Approaches. 4 Hours.** Same as Psch 552. Piaget's and Vygotsky's theories of knowledge development. Emphasis on competing approaches concerning the relation of thought to action, to language, and to social relations. Prerequisites: EPsy 429 or the equivalent, and admission into the PhD program in the College of Education or Psychology or consent of the instructor.

**530. Achievement Motivation. 4 Hours.** Same as Psch 525. The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. Prerequisite: Graduate standing in education or psychology or consent of the instructor.

**546. Educational Measurement. 4 Hours.** Introduces

methods based on true score theory, generalizability theory, and Rasch measurement that are used to address issues of reliability and validity. Prerequisites: Ed 501 and Ed 503/EPsy 503 or the equivalents or consent of the instructor.

**547. Multiple Regression in Educational Research. 4 Hours.** Introduction to multiple correlation and regression techniques as tools for the analysis and interpretation of educational and behavioral science data. Prerequisite: EPsy 503.

**550. Rating Scale and Questionnaire Design and Analysis. 4 Hours.** Development and administration of rating scales and questionnaires, analysis of data, and reporting of results. The focus is on rating scales. Prerequisites: Ed 501 and Ed503/EPsy 503 or the equivalents or the consent of the instructor.

**554. Analysis of Content for Instruction. 4 Hours.** Same as DA 502. Psychological factors influencing the analysis of content for the development of procedures, materials and systems for instruction in subject matter disciplines. Prerequisite: Consent of the instructor.

**555. Instructional Design. 4 Hours.** Same as DA 504. Principles and practice in instructional development, including design models for various content outcomes, student and media characteristics; formative evaluation of materials. Prerequisite: Credit or concurrent registration in EPsy 554.

**556. Theory and Development of Instructional Microcomputing. 4 Hours.** Same as DA 505. Analysis of instructional applications of microcomputing; emphasis upon theory of courseware design, development, and implementation; courseware selection and management factors in instructional settings. Prerequisite: EPsy 555 or consent of the instructor.

**557. Instructional Technology. 4 Hours.** Same as DA 506. Training and laboratory work in computer-assisted instruction, audiovisual media, interactive video; development and implementation costs; problems of integrating instructional technology into educational systems. Prerequisite: EPsy 555 or consent of the instructor.

**563. Advanced Analysis of Variance in Educational Research. 4 Hours.** Detailed coverage of the principles of analysis of variance and the analysis of data collected from research employing experimental designs. Prerequisite: EPsy 503.

**583. Multivariate Analysis of Educational Data. 4 Hours.** Introduction to multivariate statistical methods in education including data screening, canonical correlation, MANOVA/MANCOVA, DFA, profile analysis, component/factor analysis, confirmatory factor analysis, and structural equation modeling. Prerequisite: EPsy 547 or EPsy 563.

**588. Current and Specialized Topics in Psychometrics. 1 Hour.** May be repeated for credit. Satisfactory/Unsatisfactory grade only. Seminar on current and specialized topics in psychometrics. Extensive computer use required. Meets eight weeks of the semester. Prerequisites: Credit or concurrent registration in EPsy 546 or credit or concurrent registration in EPsy 550; and credit or concurrent registration in EPsy 503; or consent of the instructor.

**589. Topics in Educational Statistics. 4 Hours.** May be repeated for credit. Seminar on a pre-announced topic on educational statistical methodology for the analysis of educational data. Prerequisite: EPsy 547.

**593. PhD Research Project. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the PhD in education program.

**594. Special Topics in Educational Psychology. 1 to 4 Hours.** May be repeated for up to 12 hours of credit. Seminar on a pre-announced topic focusing on methodology, research, and educational implications of recent models of learning, problem solving, and thinking. Prerequisites: Ed 421 and 422, or consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for up to 12 hours of credit. Students may register for more than one section per term. Students carry out independent study in educational psychology under the direction of a faculty member. Prerequisites: Ed 490 or the equivalent, and consent of the advisor and the instructor.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student's dissertation. Prerequisite: Consent of the dissertation advisor.



## Electrical and Computer Engineering (ECE)

**400. Introduction to Microelectromechanical Systems. 4 Hours.** Previously listed as EECS 400. Definition, classification and case studies of transducers, sensors and actuators. Microfabrication methods for microelectromechanical systems (MEMS). Design, simulation and modeling of MEMS. Prerequisites: ECE 220 and ECE 346 or the equivalent.

**401. Quasi-Static Electric and Magnetic Fields. 4 Hours.** Previously listed as EECS 401. Static electric and magnetic fields. Material description, boundary value problems. Field energy, its conversion and scaling laws. Quasi-static fields, field diffusion, eddy currents, energy losses. Prerequisite: ECE 220 or the equivalent.

**407. Pattern Recognition I. 4 Hours.** Previously listed as EECS 407. Same as Bioengineering 407. The design of automated systems for detection, recognition, classification, and diagnosis. Parametric and nonparametric decision-making techniques. Applications in computerized medical and industrial image and waveform analysis. Prerequisite: Math 220.

**410. Network Analysis. 4 Hours.** Previously listed as EECS 410. Matrix algebra for network analysis. Introductory network topology. Matrix loop, node, and state variable equations. Network functions and theorems. Topics in computer-aided analysis. Prerequisites: ECE 225 and ECE 310.

**412. Introduction to Filter Synthesis. 4 Hours.** Previously listed as EECS 412. Fundamentals of network synthesis, filter approximations and frequency transformations. Active filter synthesis using bi-linear and bi-quad circuits. Topics in computer-aided design. Prerequisites: ECE 225 and ECE 310.

**415. Image Analysis and Machine Vision. 4 Hours.** Previously listed as EECS 415. Image formation, geometry and stereo. Two-dimensional image analysis by Fourier and other 2D transforms. Image enhancement, color, image segmentation, compression, feature extraction, object recognition. Prerequisite: ECE 310 or Math 310.

**418. Digital Signal Processing II. 4 Hours.** Previously listed as EECS 418. Computer-aided design of digital filters; quantization and round-off effects; FFT algorithms; number-theoretic algorithms; Hilbert transform; complex cepstrum; multirate signal processing; linear filtering; system identification; matching. Prerequisite: ECE 317.

**420. Introduction to Microwave Engineering. 4 Hours.** Previously listed as EECS 420. TEM waves in coaxial and strip lines; TE and TM waves in rectangular and circular wave guides; components; resonators. Laboratory and computer simulation required. Prerequisite: ECE 322.

**421. Introduction to Antenna Engineering. 4 Hours.** Previously listed as EECS 421. Radiation; antenna parameters; theorems of antenna; radiation from linear wire and loop antennas; impedance; linear arrays; traveling wave wire antennas. Design project and computer simulation required. Prerequisite: ECE 322.

**422. Wave Propagation and Communication Links. 4 Hours.** Previously listed as EECS 422. Antennas and propagation; wave propagation over ground, through ionosphere and troposphere; diversity principles; propagation effects in microwave systems, satellite, space, and radar links. Prerequisites: ECE 311 and ECE 322.

**423. Electromagnetic Compatibility. 4 Hours.** Previously listed as EECS 423. EMC requirements for electronic systems. Nonideal behavior of components. Radiated and conducted emissions. Susceptibility. Coupling and shielding. Electrostatic discharge. System design for EMS. Prerequisite: ECE 322.

**426. Microwave Semiconductor Devices. 4 Hours.** Previously listed as EECS 426. Device and circuit behavior at microwave frequencies. Noise characterization. Detectors and mixers. Parametric electronics. Microwave diodes. Oscillators and amplifiers. Microwave transistors and circuit design. Prerequisites: ECE 320 and ECE 346.

**427. Modern Linear Optics. 4 Hours.** Previously listed as EECS 427. Two-dimensional Fourier analysis. Scalar diffraction and applications: aperture arrays, gratings and lenses. Imaging. Holography. Optical systems in spatial frequency domain. Optical signal processing. Tomography. Prerequisite: ECE 322.

**429. Plasma. 4 Hours.** Same as Physics 429. Previously listed as EECS 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to kinetic theory. Prerequisite: ECE 322.

**430. Communication and Signal Processing. 4 Hours.** Previously listed as EECS 430. Random processes, signal to noise ratio, spectral and correlation analysis, filtering of random processes, bandpass noise, noise in communications, statistical signal processing. Prerequisites: ECE 311 and either ECE 341 or IE 342 or STAT 381 or STAT 401.

**431. Analog Communication Circuits. 4 Hours.** Previously listed as EECS 431. Laboratory. Analog communication circuits, oscillators, crystals, mixers, AM generation and detection. FM generators and discriminators. Phase-locked loops. Commercial communication circuits. Prerequisites: ECE 311 and ECE 340.

**432. Digital Communications. 4 Hours.** Previously listed as EECS 432. Source coding, quantization, signal representation, channel noise, optimum signal reception, digital modulation: ASK, PSK, FSK, MSK, M-ary modulation. Probability of error. Inter-symbol interference. Prerequisite: ECE 311 and either ECE 341 or IE 342 or Stat 381 or Stat 401.

**433. Computer Communication Networks I. 4 Hours.** Previously listed as EECS 433. Credit is not given for ECE 433 if the student has credit in CS 450. Overview of networks, physical layer, data link protocols, multiple access, local area networks, network layer, Internet, ATM, routing, congestion control, IP protocol, transport layer. Prerequisite: ECE 341 or IE 342 or Stat 381 or Stat 401.

**434. Multimedia Communication Networks. 4 Hours.** Extensive computer use required. Multimedia systems; compression standards; asynchronous transfer mode; Internet; wireless networks; television; videoconferencing; telephony; applications. Prerequisite: ECE 433.

**435. Wireless Communication Networks. 4 Hours.** Previously listed as EECS 435. Radio technology fundamentals; channel and propagation models; channel multiple access technologies; wireless mobile communication fundamentals; generic wireless mobile network; cellular/PCS wireless mobile network standards. Prerequisites: ECE 432 and ECE 433.

**436. Computer Communication Networks II. 4 Hours.** Extensive computer use required. Explores integrated network architecture of service, control signaling and management, examples of high-speed LAN/WAN, next generation Internet and mobile wireless network. Prerequisite: ECE 433.

**442. Power Semiconductor Devices and Integrated Circuits. 5 Hours.** Previously listed as EECS 442. Breakdown physics; edge termination techniques; P-i-N and Schottky power rectifiers; power MOSFETs; conductivity-modulated high-power devices; wide bandgap semiconductors; emerging material technologies device modeling. Prerequisite: ECE 340.

**445. Analysis and Design of Power Electronic Circuits. 5 Hours.** Previously listed as EECS 445. Power switching components. Analysis of different DC-to-DC converter operations. Output voltage regulation. Practical converter design. Zero-current and zero-voltage soft switching converters. Prerequisites: ECE 310 and ECE 342.

**448. Transistors. 4 Hours.** Previously listed as EECS 448. Bipolar junction transistors, electronic processes in surface-controlled semiconductor and dielectric devices. Properties of MIS field-effect capacitors and transistors, surface and interface effects. Prerequisite: ECE 346.

**449. Microdevices and Micromachining Technology. 5 Hours.** Previously listed as EECS 449. Laboratory. Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Simulation experiments. Prerequisite: ECE 347.

**451. Control Engineering. 4 Hours.** Previously listed as EECS 451. State-space representation of systems; realization theory; stability; performance; modern control design techniques, including: fuzzy, learning, adaptive and nonlinear control. Prerequisite: ECE 350.

**452. Robotics: Algorithms and Control. 4 Hours.** Kinematic and dynamic modeling of robots; configuration space; motion planning algorithms; control of robots; sensors and perception; reasoning;



mobile robots. Prerequisites: CS 201 and either ECE 210 or ECE 225 or consent of the instructor.

**458. Electromechanical Energy Conversion. 4 Hours.**

Previously listed as EECS 458. Electromagnetic forces and torque; magnetic circuits and transformers; DC machines; three-phase AC synchronous and induction machines; laboratory-demonstrations. Projects are required. Prerequisite: ECE 225.

**465. Digital Systems Design. 4 Hours.** Previously listed as EECS 465. Switching algebra, combinational circuits, Mux, ROM, PLA-based designs, minimization techniques, synchronous and asynchronous sequential circuits (minimization, hazards, races, state assignment, retiming), fault analysis, testing. Prerequisite: ECE 265, or CS 366 and either ECE 220 or Phys 142.

**466. Advanced Computer Architecture. 4 Hours.**

Previously listed as EECS 466. Credit is not given for ECE 466 if the student has credit in CS 466. Design and analysis of high performance uniprocessors. Topics include arithmetic: multiplication, division, shifting; processor: pipelining, multiple function units. Instruction sets; memory: caches, modules; virtual machines. Prerequisite: ECE 366.

**467. Introduction to VLSI Design. 5 Hours.** Previously listed as EECS 467. Laboratory. MOS, CMOS circuits VLSI technology, CMOS circuit characterization and evaluation. Static and dynamic MOS circuits, system design, faults, testing, and symbolic layout. Advanced topics. Prerequisite: ECE 340.

**468. Analog and Mixed-Signal VLSI Design. 5 Hours.**

Previously listed as EECS 468. Elementary transistor stages and analog components; low-power design; comparison of bipolar, CMOS, and BiCMOS; s-parameters and high-frequency ASIC design and modeling; RF wireless communication system components; behavioral modeling. Prerequisite: ECE 467.

**469. CAD-Based Computer Design. 4 Hours.** Previously listed as EECS 469. Extensive computer use required. Credit is not given for ECE 469 if the student has credit in CS 469. Use of modern CAD tools for computer system design, hardware, description languages, simulation, design verification, synthesis. Design assignments, projects using CAD. Prerequisites: ECE 368 and ECE 465 and ECE 466.

**491. Seminar. 1 to 4 Hours.** Previously listed as EECS 491. May be repeated for credit. Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the Timetable. Prerequisite: Consent of the instructor.

**493. Special Problems. 2 to 4 Hours.** Previously listed as EECS 493. No graduate credit for electrical and computer engineering majors. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.

**510. Advanced Network Analysis. 4 Hours.** Previously listed as EECS 510. Characterizations of networks. The indefinite-admittance matrix. Active two-port networks. Theory of feedback amplifiers. Stability of feedback amplifiers. Multiple-loop feedback amplifiers. Prerequisite: ECE 410.

**513. Advanced Filter Synthesis. 4 Hours.** Previously listed as EECS 513. The active biquad. Sensitivity analysis. Realization of active two-port networks. Design of broadband matching networks. Theory of passive cascade synthesis. Prerequisite: ECE 412.

**515. Image Analysis and Machine Vision II. 4 Hours.** Previously listed as EECS 515. Image analysis techniques, 2-D and 3-D shape representation, segmentation, camera and stereo modeling, motion, generic object and face recognition, parallel and neural architectures for image and visual processing. Prerequisite: ECE 415 or consent of the instructor.

**516. Optimal and Adaptive Digital Filters. 4 Hours.**

Previously listed as EECS 516. Properties of signals; optimal filters, Wiener and Kalman filters; signal modeling, adaptive filters channel equalizing, echo canceling, noise canceling, and linear prediction; filter properties. Prerequisite: ECE 317.

**517. Digital Image Processing. 4 Hours.** Previously listed as EECS 517. Operations on 2-D digital images such as transforms, enhancement, restoration, warping, segmentation, registration, compression, and reconstruction from projection. Prerequisite: ECE 317.

**518. Theory of Nets. 4 Hours.** Previously listed as EECS 518. Graphs and networks. The shortest directed path problem. Maximum flows in networks. Minimum trees and communications nets. Feasibility theorem. Applications of flow theorems, subgraph problems.

**520. Electromagnetic Field Theory. 4 Hours.** Previously listed as EECS 520. Maxwells equations. Potentials. Constitutive relations. Special relativity. Boundary conditions. Green's functions. Polarization. Radiation from antennas and charged particles. Waveguides and resonators. Exterior boundary-value problems. Prerequisite: ECE 420 and 421.

**521. Computational Electromagnetics. 4 Hours.**

Previously listed as EECS 521. Finite-element, finite-difference solution. Computer-aided solutions: integral equations, method of moments, transform and iterative solutions. FD-TD, singularity expansion method. Practical problems in radiation and scattering. Prerequisite: ECE 520.

**522. Advanced Microwave Theory. 4 Hours.**

Previously listed as EECS 522. Microwave integrated circuits: analysis, design. Microwave devices: filters, cavities and phase shifters. Millimeter waves: components and circuits, millimeter wave applications. Prerequisites: ECE 420 and 520.

**523. Advanced Antenna Engineering. 4 Hours.**

Previously listed as EECS 523. Radiation from helix and spiral; aperture antennas; linear and planar array synthesis; Hallen's and other methods for impedance; design of array feeds; reflector and lens antennas. Prerequisites: ECE 421 and 520.

**524. High Frequency Electromagnetic Systems and Packaging. 4 Hours.**

Previously listed as EECS 524. Electromagnetic effects on high-frequency circuits, computer-aided design and simulation of high-frequency integrated circuits. Packaging designs for cross-talk minimization. Prerequisite: ECE 401.

**526. Electromagnetic Scattering. 4 Hours.** Previously listed as EECS 526. Exact solutions of exterior boundary-value problems. Low-frequency expansions. High-frequency methods, including geometrical and physical theories of diffraction. Hybrid techniques. Radar cross-sections. Prerequisite: ECE 520.

**527. Optical Electronics. 4 Hours.** Previously listed as EECS 527. Optical resonators. Radiation and atomic systems. Laser oscillation. Laser systems. Parametric amplification and oscillation. Electro-optics and acoustooptics. Phase conjugate optics. Modulation, detection and noise. Prerequisite: ECE 520.

**528. Fiber and Integrated Optics. 4 Hours.** Previously listed as EECS 528. Propagation in thin films and fibers. Mode launching, coupling, and losses. Sources, detectors, modulators, interferometers. Fabrication and measurement techniques. Fiber optics systems. Prerequisite: ECE 520 or the equivalent.

**530. Random Signal Analysis. 4 Hours.** No credit given if the student has credit in EECS 530. Probability for communications, properties and series representations of random processes, random processes through linear and nonlinear systems, minimum MSE and maximum SNR systems. Prerequisite: ECE 430.

**531. Detection and Estimation Theory. 4 Hours.**

Previously listed as EECS 531. Bayes, Neyman-Pearson and minimax detection for discrete and continuous time random processes. Estimation of random and nonrandom signal parameters. Estimation of signals. Prerequisite: ECE 530.

**532. Advanced Digital Communications. 4 Hours.**

Previously listed as EECS 532. Characteristics of digitally modulated signals; digital signals in additive noise; communication over fading channels and with intersymbol interference; source and channel coding; synchronization; spread spectrum techniques. Prerequisite: ECE 432.

**534. Elements of Information Theory. 4 Hours.** Previously listed as EECS 534. Entropy and mutual information, asymptotic equipartition property stochastic process entropy rates, data compression Kolmogorov complexity, channel capacity, rate distortion theory, information theory applications. Prerequisite: ECE 430.

**535. Advanced Wireless Communication Networks. 4**

**Hours.** Previously listed as EECS 535. 2nd generation: IS-95-based wireless mobile network; 2nd generation: GSM-based wireless mobile network; 2.5 generation: wireless mobile data/voice network; 3rd

generation: broadband wireless mobile multimedia network. Prerequisite: ECE 435.

**540. Physics of Semiconductor Devices. 4 Hours.**

Previously listed as EECS 540. Same as Phys 540. Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions, in homogeneous semiconductors; recombination and generation; nonequilibrium processes, radiation and electronic fields; diodes. Prerequisite: ECE 346 or the equivalent.

**541. Microelectronic Fabrication Techniques. 4 Hours.**

Previously listed as EECS 541. Current fabrication techniques of microelectronic technology; plasma and CVD processes; etching techniques; ion implantation; surface analytical methods. Prerequisite: ECE 540.

**542. Semiconductor Device Theory. 4 Hours.** Previously listed as EECS 542. Theory and design of several semiconductor devices of current interest, from among unipolar devices, bipolar devices, high-speed and microwave devices, and optical devices. Prerequisite: ECE 540.

**544. Advanced Theory and Technology of Devices. 4 Hours.**

Previously listed as EECS 544. Same as Bioe 544. Theory, design, and technology of a selected semiconductor device at current research and industrial state-of-the-art level. Prerequisite: ECE 540.

**545. Analysis and Design of Switching Power Converters. 4 Hours.**

Previously listed as EECS 545. Magnetics design principles and rectifier circuits. DC-to-DC switch-mode converters. Modelling of DC-to-DC resonant converters. Resonant, nonresonant couplings. Analysis, design of resonant and quasi-resonant converters. Control techniques. Prerequisite: ECE 445.

**546. Chemical and Biosensors. 4 Hours.**

Previously listed as EECS 546. Thermodynamics, adsorption, interfaces. Membranes, biosensor principles. Chemical, gas, electrolyte sensors and their applications. Prerequisite: ECE 449 or the equivalent.

**550. Linear Systems Theory and Design. 4 Hours.**

Previously listed as EECS 550. State variable description, linear operators, impulse response matrix controllability and observability, irreducible realization, state feedback and state estimators and stability. Prerequisite: ECE 350.

**551. Optimal Control. 4 Hours.**

Previously listed as EECS 551. Optimal control of dynamic systems in continuous and discrete time. The maximum principle and dynamic programming, considering constraints as they arise in practical systems; optimization performance. Prerequisite: ECE 550.

**552. Nonlinear Control. 4 Hours.**

Previously listed as EECS 552. Nonlinear phenomena, linear and piecewise linear approximations. Describing function and on-off servomechanisms, phase plane techniques, limit cycle, Lyapunov's stability theory, bifurcations, bilinear control, vibrational control. Prerequisite: ECE 451.

**553. System Identification. 4 Hours.**

Previously listed as EECS 553. On-line and off-line identification of control systems in frequency and time domain, considering noise effects, nonlinearities, nonstationarities and distributed parameters. Prerequisite: ECE 550.

**559. Neural Networks. 4 Hours.**

Previously listed as EECS 559. Artificial neural networks for parallel computing including perceptrons, backpropagation and Kohonen nets, statistical methods in neural computing, Hopfield nets, associative memories, cognition and neocognition. Prerequisite: Consent of the instructor.

**560. Fuzzy Logic. 4 Hours.**

Previously listed as EECS 560. Crisp and fuzzy sets; membership functions; fuzzy operations; fuzzy relations and their solution; approximate reasoning; fuzzy modeling and programming; applications; project. Prerequisite: Consent of the instructor.

**565. VLSI Design Automation. 4 Hours.**

Previously listed as EECS 565. Computer-aided physical design of integrated circuits; circuit partitioning and placement; floorplanning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation. Prerequisites: CS 401 and ECE 465.

**566. Parallel Processing. 4 Hours.**

Previously listed as EECS 566. Parallel processing from the computer science perspective. Includes architecture (bus based, lockstep, SIMD), programming languages (functional, traditional and extensions), compilers, interconnection networks, and algorithms. Prerequisite: ECE 466.

**567. Advanced VLSI Design. 4 Hours.** Previously listed as EECS 567. VLSI subsystem and system design: synthesis, design styles, design process, testing. Case studies: switching networks, graphics engine, CPU. Projects use computer-aided design tools. Prerequisite: ECE 467.

**569. High-Performance Processors and Systems. 4 Hours.**

Previously listed as EECS 569. Instruction-level parallelism, multiple-instruction issue, branch prediction, instruction and data prefetching, novel cache and DRAM organization, high-performance interconnect, compilation issues, case studies. Prerequisite: ECE 466.

**594. Special Topics. 4 Hours.**

Previously listed as EECS 594. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

**595. Departmental Seminar. 0 Hours.**

Previously listed as EECS 595. May be repeated. S/U grade only. Seminar by faculty and invited speakers.

**596. Individual Study. 1 to 4 Hours.**

Previously listed as EECS 596. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Individual study or research under close supervision of a faculty member. For ECE majors only. Prerequisite: Consent of the instructor.

**597. Project Research. 0 to 9 Hours.**

Previously listed as EECS 597. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. A research design or reading project approved by the committee appointed by the director of graduate studies. Prerequisite: Consent of the instructor.

**598. MS Thesis Research. 0 to 16 Hours.**

Previously listed as EECS 598. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. MS thesis work under the supervision of a graduate adviser. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.**

Previously listed as EECS 599. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. PhD thesis work under supervision of a graduate adviser. Prerequisite: Consent of the instructor.

## Engineering (Engr)

**400. Engineering Law. 4 Hours.**

Overview of the legal system. Legal principles affecting the engineering profession. Professional ethics in engineering. Intellectual property laws. Basic contract and tort principles. Environmental law.

## English (Engl)

**400. History of the English Language. 4 Hours.**

Development of English from its Proto-Indo-European origin to the present; detailed examination of the external and internal history of Old, Middle, and Modern English.

**401. Modern English. 4 Hours.**

Critical study of traditional, structural, and generative-transformational grammatical descriptions, language variation, and lexicology.

**402. Rhetoric. 4 Hours.**

Theories of rhetoric. Relationships of rhetoric to linguistics, literary criticism, philosophy, and psychology. Readings in classical, Renaissance, eighteenth-century, and modern theories.

**403. Introduction to Old English. 4 Hours.**

The elements of Old English grammar and readings from the literature of England before the Norman Conquest.

**404. Beowulf. 4 Hours.**

A detailed explication of the poem. Prerequisite: Engl 403 or the equivalent.

**406. Medieval Drama. 4 Hours.**

English drama from its liturgical beginnings in the tenth century to the advent of humanist drama in the early sixteenth century.

**407. Chaucer's Poetry. 4 Hours.**

A study of Troilus and Creseyde, The Parliament of Fowls, The Book of the Duchess, and others of Chaucer's poems, in the context of the culture and language of the late Middle Ages.

- 409. History of Rhetorical Theory: Antiquity Through the Middle Ages. 4 Hours.** Representative texts and figures such as Plato, Aristotle, Cicero, Quintilian, Augustine; consideration of historical factors that influence interpretation and practical applications of rhetorical theory. Prerequisite: Engl 402 or consent of the instructor.
- 410. English Literature of the Sixteenth Century. 4 Hours.** Literature of the age of Henry VIII and Elizabeth I; emphasis on More, Wyatt, Sidney, Spenser, and Shakespeare.
- 411. English Literature of the Seventeenth Century. 4 Hours.** English literature from 1600-1674, with particular attention to the literary and social movements of the early decades and the Revolution. Emphasis on Donne, Jonson, Herbert, Hobbes, Marvell, and Milton.
- 412. Renaissance Drama, Exclusive of Shakespeare. 4 Hours.** Tudor and Stuart drama, with emphasis on Marlowe, Jonson, and Webster.
- 413. Studies in Shakespeare. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a genre, topic or period in Shakespeare's work.
- 414. Studies in Renaissance Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a major author, topic, or genre of the sixteenth and seventeenth centuries.
- 415. Milton. 4 Hours.** Same as ReLS 415. Survey of Milton's poetry and prose, with emphasis on *Paradise Lost*. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.
- 418. History of Rhetorical Theory: Renaissance Through the Nineteenth Century. 4 Hours.** Representative movements such as Ramistic, neoclassical, Romantic, belletristic, and elocutionary rhetorics; consideration of historical factors that influence interpretation and practical applications of rhetorical theory. Prerequisite: Engl 402 or 409 or consent of the instructor.
- 420. English Literature of the Restoration and the Eighteenth Century. 4 Hours.** Survey of significant works from 1660-1789, with emphasis on Dryden, Pope, Swift, and Johnson, and of significant literary trends.
- 423. Restoration and Eighteenth-Century Drama. 4 Hours.** Representative plays and dramatic criticism from Dryden and Etherege to Goldsmith and Sheridan.
- 424. Eighteenth-Century Novel. 4 Hours.** Representative novels by Defoe, Richardson, Fielding, Smollett, Sterne, and others, including the Gothic novel.
- 425. Topics in Restoration and Eighteenth-Century Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of an author or authors, theme, genre, or movement. Content varies.
- 430. British Romantic Literature. 4 Hours.** Literature of Britain, 1789-1932, with emphasis on poetry and nonfiction prose of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.
- 431. Topics in British Romantic Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of an author or authors, theme, or genre. Content varies.
- 432. Victorian Literature. 4 Hours.** Poetry and nonfiction prose of the Victorian era, with emphasis on Tennyson, Browning, Arnold, Carlyle, and selected later Victorian writers exclusive of the novelists.
- 434. Topics in Victorian Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Major Victorian authors, such as Arnold, Browning, Carlyle, Dickens, Eliot, Tennyson, Thackeray, or study of a topic, movement, or genre.
- 435. Nineteenth-Century British Fiction. 4 Hours.** Representative selections: emphasis on Austen, Scott, Dickens, Thackeray, Trollope, Eliot, Meredith, Butler, Hardy.
- 436. Nineteenth-Century British Nonfictional Prose. 4 Hours.** Representative selections: the prose of Wordsworth and Coleridge, other representative essayists such as Hazlitt, DeQuincy, Lamb, Carlyle, Mill, Ruskin, Newman, Arnold, Pater.
- 450. Modern British Literature: 1890 to 1950. 4 Hours.** Representative selections, with emphasis on poetry and fiction of the period.
- 451. Contemporary British Literature. 4 Hours.** Representative selections, with emphasis on poetry and fiction of the period.
- 452. Developments in Contemporary Fiction. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies.
- 453. Developments in Contemporary Poetry. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies.
- 454. Twentieth-Century Rhetorical Theory. 4 Hours.** Survey of perspectives that comprise the interdisciplinary modern understanding of rhetoric; readings in language, philosophy, social science, literary theory, composition theory, reading theory. Prerequisite: Engl 402 or 418 or consent of the instructor.
- 455. Topics in Literature: 1900 to the Present. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a major author, topic, movement, or genre of literature in English. Content varies.
- 456. Contemporary Literature in English. 4 Hours.** Selection of readings designed to provide a global perspective on literature in English from various parts of the world.
- 457. Topics in Modern Drama. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of an author, topic, or movement. Content varies.
- 458. Postcolonial Literature. 4 Hours.** Literature in English written in the context of the dismantling of colonial empires and the decolonization of indigenous people during the latter half of the twentieth century.
- 460. Genres in American Literature Through 1914. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Concentration on a single genre, such as poetry, the novel, the short story, and nonfiction prose. Content varies.
- 464. Modern American Literature: 1900 to 1950. 4 Hours.** Representative selections, with emphasis on poetry and fiction of the period.
- 465. Contemporary American Literature: 1950 to the Present. 4 Hours.** Representative selections with the emphasis on poetry and fiction of the period.
- 466. Major Authors in American Literature Through 1914. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Analysis of works by a single author, such as Hawthorne, Melville, Whitman, Dickinson, James, Twain, Dreiser. Content varies.
- 467. Periods and Movements in American Literature Through 1914. 4 Hours.** May be repeated for a maximum of 8 hours of credit. A single period, such as early American literature or the Gilded Age or a single movement, such as Puritanism, Transcendentalism, or Naturalism.
- 468. Topics in American Literature to 1914. 4 Hours.** May be repeated for a maximum of 8 hours of credit. A single topic, such as the idea of success in American literature, or the literature of the Civil War, or landscape in American literature and painting.
- 469. Women's Literary Traditions. 4 Hours.** Same as GWS 469. An exploration of issues such as the female aesthetic, women's popular literature, factors that enable creativity, differences of race and class.
- 470. Studies in Multiethnic Literatures in the United States. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Studies in the literatures of American racial and ethnic groups. Content varies.
- 471. Studies in Native American Literatures. 4 Hours.** Same as NAST 471. May be repeated for a maximum of 8 hours of credit. The history and development of literature by and about American Indians. Content varies.
- 472. Women and Film. 4 Hours.** Same as AH 434 and GWS 472. Roles and representations of women in classical Hollywood, European art, and independent feminist cinemas.
- 473. Topics in African-American Literature. 4 Hours.** Same as AAST 490. May be repeated for credit. Students may register for more than one section per term. African-American literature and culture for students with significant background in the field. Topics vary. Prerequisite: AAST 110 or 111 or 250 or consent of the instructor.
- 474. Studies in Popular Culture and Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a topic or genre such as the American 1930's or science fiction; critical approaches to the study of popular literature and culture. Content varies.



- 475. History of Literary Criticism. 4 Hours.** Readings drawn from the entire range of the Western literary tradition from Plato to the present that provide the foundation necessary to understand the history of literary criticism.
- 476. Studies in the History of Literary Criticism. 4 Hours.** Study of a topic, movement, or author. Content varies.
- 477. Studies in Literary Theory. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic or movement. Content varies.
- 478. The Bible as Literature. 4 Hours.** Same as JSt 478, RelS 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.
- 479. Religion and Literature. 4 Hours.** Same as RelS 479. Literary works considered in the light of several religious traditions. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.
- 480. Reading Black Women Writing. 4 Hours.** Same as AAS 470 and GWS 470. Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. Prerequisite: AAS 110 or 111 or 250 or consent of the instructor.
- 481. Teaching of English. 4 Hours.** All students in the teacher education program must take this course in the term preceding their student teaching. Theory and practice; emphasis on current approaches to language and literature.
- 482. Campus Writing Consultants. 4 Hours.** Tutoring in the Writing Center. Students are required to consult with others on their writing. Emphasis on practice and theories of writing. Appropriate for prospective teachers. Prerequisite: 9 hours of English and consent of the instructor. Students must obtain override from Writing Center.
- 483. Studies in Language and Rhetoric. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a particular topic or movement in language or rhetoric. Content varies.
- 484. Studies in Language and Cognition. 4 Hours.** Examination of relationships among theories of language structure, cognition, and discourse, with applications of such theories to the writing process. Prerequisite: Engl 401 or consent of the instructor.
- 485. Studies in the English Language and Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic such as language diversity and literacy, theories of grammar, literacy in society, ethnicity, and language. Content varies.
- 486. Studies in Teaching Rhetoric and Composition. 4 Hours.** Rhetoric and composition pedagogy. Study of a topic. Content varies.
- 490. Advanced Writing of Poetry. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Advanced work on poetic techniques and practices; emphasis on analysis of student work, using published examples; particular attention to individual student development.
- 491. Advanced Writing of Fiction. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Advanced practice; emphasis on analysis of student work and published examples.
- 492. Advanced Writing of Nonfiction Prose. 4 Hours.** May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Advanced practice in writing essays, articles, reviews, or other forms of nonfiction prose. Content varies.
- 493. Internship in Nonfiction Writing. 4 Hours.** Credit is not given for Engl 493 if the student has credit in Engl 593. May be repeated once for a maximum of 8 hours of credit, 4 of which may be counted toward the graduate degree in English. Individual projects in approved professional setting to practice writing skills at an advanced level. Prerequisite: Engl 202 or the equivalent and an interview with the coordinator of the internship program prior to registration. Students will be registered in this course subject to approval by the coordinator. Resume and writing samples are required by LAS CO-OP.
- 494. Topics in the Teaching of English. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Study of a topic in literature, composition, and/or pedagogy. The content varies with each offering. Prerequisite: Consent of the instructor.
- 495. Playwriting. 4 Hours.** Same as Thtr 423. The development of scripts for stage performance. Prerequisites: Approval of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.
- 496. Studies in Modes, Influences, and Movements. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Study of a particular subject in literature.
- 497. Backgrounds to English and American Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Areas of mythology, mythography, the Bible, and major works of literature important to an understanding of English and American literature. Content varies.
- 498. Educational Practice with Seminar I. 6 Hours.** S/U grade only. Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.
- 499. Educational Practice with Seminar II. 6 Hours.** S/U grade only. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Engl 498, and approval of the department.
- 500. Introduction to Bibliography and Research. 4 Hours.** Study of bibliographic tools and research techniques.
- 501. Introduction to Research in Language, Literacy, and Rhetoric. 4 Hours.** Surveys disciplinary foundations of research on language, literacy, and rhetoric. Issues and methods are introduced with special emphasis on work relating to culture, cognition, and rhetoric.
- 503. Theory and Practice of Literary Criticism. 4 Hours.** Forms and theories of literary criticism, analysis of their application to specific literary genres and works, and practice in writing literary criticism.
- 504. Seminar in Literary Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic or movement. Content varies. Prerequisite: Engl 503.
- 505. Seminar in Old English. 4 Hours.** A topic in Old English: emphasis on literature or philology. Content varies. Prerequisite: Engl 404 or the equivalent.
- 515. Seminar in Middle English Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. The works of Chaucer and other Middle English writers. Content varies. Prerequisite: A minimum of 3 hours in Middle English literature.
- 518. Newberry Library Seminar in Renaissance Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Late Medieval and Renaissance literature. In conjunction with the Newberry Library Center for Renaissance Studies. Prerequisites: Engl 503 and 3 hours of Medieval or Renaissance literature.
- 520. Seminar in Renaissance Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. English literature of the sixteenth and seventeenth centuries. Topic varies. Prerequisite: One course in Renaissance literature.
- 525. Seminar in Restoration and 18th Century Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Content varies. Prerequisite: One course in Restoration or 18th century literature.
- 530. Seminar in British Romantic Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Advanced study of author(s), topic, movement, or genre. Content varies. Prerequisite: One course in Romantic literature.
- 535. Seminar in Victorian Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Focus on author, topic, movement, or genre. Content varies. Prerequisite: 3 hours of Victorian literature or consent of the instructor.
- 540. Seminar in Modern Literature in English. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of an author, topic, movement, or genre. Content varies. Prerequisite: A minimum of three hours in modern literature.



**545. Seminar in American Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Content varies. Prerequisite: One advanced course in American literature.

**551. Research Practicum in Ethnography/Sociolinguistics. 4 Hours.** Same as Ling 551. May be repeated for a maximum of 12 hours of credit. Conceptualization and implementation of exploratory ethnographic research project. Prerequisite: Engl 485 or previous coursework in ethnographic research.

**552. Research Practicum in Language and Cognition. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Research design and methods examining theories of the development of literacy and relationships among learner, text, and context. Prerequisite: Engl 484.

**553. Research Practicum in Discourse Analysis. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Theory of, and guided practice in, the analysis of written texts, both whole discourses and units.

**554. Seminar in English Education. 4 Hours.** Critical examination of theory and practice in the teaching of English. Content varies.

**555. Teaching College English. 4 Hours.** S/U grade only. Methods, materials, and practice in teaching college English.

**556. Teaching Creative Writing. 4 Hours.** S/U grade only. Methods, materials, and practice in teaching creative writing. Prerequisite: Admission to the Program for Writers or consent of the instructor.

**558. Topics in Language and Rhetoric. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic or movement in linguistic or rhetorical theory. Content varies. Prerequisite: Engl 401 or 402 or consent of the instructor.

**560. Practicum in the Teaching of English. 1 to 4 Hours.** No graduation credit. S/U grade only. May be repeated for credit. For English department teaching assistants. Provides an opportunity for supervised discussion and evaluation of materials and methods used in undergraduate English instruction. Participation in appropriate departmental workshops. Prerequisite: Students may enroll only during terms in which they hold a teaching assistantship in the English department.

**570. Program for Writers: Poetry Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on poems written by students. Prerequisite: Admission to the Program for Writers.

**571. Program for Writers: Fiction Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on fiction written by students. Prerequisite: Admission to the Program for Writers.

**572. Program for Writers: Novel Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on novels written by students. Prerequisite: Admission to the Program for Writers.

**573. Program for Writers: Translation Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on translations by students. Prerequisite: Admission to the Program for Writers or consent of the instructor.

**574. Program for Writers: Nonfiction Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on nonfiction written by students. Prerequisite: Admission to the Program for Writers.

**575. Program for Writers: Experimental Writing Workshop. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Emphasis on experimentation by students. Prerequisite: Admission to the Program for Writers.

**576. Program for Writers: Editing and Publishing. 4 Hours.** Practicum in basic procedures for students desiring careers in publishing, or who wish to understand the stages of production from proposal to publication. Prerequisite: Consent of the instructor.

**580. Seminar in Genres of Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. A single genre, such as the Gothic novel, or mode, such as poetry, fiction, or drama.

**581. Seminar in Literature and Related Fields. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Relation between literature and such fields as fine arts, philosophy, psychology,

religion, science, sociology, and politics. Content varies. Prerequisite: 4 hours in area of literature to be studied.

**582. Seminar in Multiethnic Literatures in the United States. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a genre, movement, topic, or author in American multiethnic literatures. Content varies. Prerequisite: Minimum of 3 hours in Native American literature.

**583. Seminar in Popular Culture. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a theme, form, era, or methodological approach. Content varies.

**584. Seminar in Film. 4 Hours.** May be repeated for a maximum of 12 hours of credit. One topic or movement. Content varies. Prerequisite: Minimum of 3 hours in film.

**585. Seminar in Language, Literacy, and Culture. 4 Hours.** May be repeated for a maximum of 12 hours of credit. One author, topic or movement in sociolinguistic theory and literacy studies. Content varies. Prerequisite: Engl 485 or previous coursework in sociolinguistic or ethnographic research.

**586. Seminar in Language and Cognition. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Interdisciplinary readings relating language and cognition from writing, rhetoric, cognitive psychology, and linguistics on a particular topic. Prerequisite: Engl 484.

**587. Seminar in the History of Literacy or Rhetoric. 4 Hours.** May be repeated for a maximum of 12 hours of credit. One author, topic, or movement in rhetorical theory from antiquity through the 19th century. Prerequisites: Engl 409 and 418 or consent of the instructor.

**588. Seminar in the Theory of Language and Rhetoric. 4 Hours.** May be repeated for a maximum of 12 hours of credit. One author, topic, or movement in modern rhetorical theory. Prerequisites: Engl 409 and 418 or consent of the instructor.

**592. Preliminary Examination Research. 1 to 8 Hours.** May be repeated for a maximum of 12 hours of credit. S/U grade only. Supervised research and reading in preparation for the preliminary examinations. Prerequisites: Consent of the instructor and consent of the director of graduate studies.

**593. Graduate Internship in Nonfiction Writing. 1 to 4 Hours.** Credit is not given for Engl 593 if the student has credit in Engl 493. May be repeated for credit; a maximum of four hours of credit may be applied toward a graduate degree in English. Directed field experience in an approved professional setting to practice writing, editing and research skills at an advanced level. Prerequisites: Consent of the English department internship coordinator. Resume and writing samples are required.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Independent study and research in Literature, Creative Writing, or Language, Literacy, and Rhetoric. Prerequisites: Consent of the instructor and consent of the Director of Graduate Studies.

**597. Master's Project Research in English. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. No more than 4 hours of Engl 597 may be applied toward the degree. S/U grade only. Supervised research and reading that facilitates the student in preparation of the Project research. Prerequisites: Open only to Master's degree students; and consent of the instructor and consent of the Director of Graduate Studies.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. For students involved in dissertation research and writing. Prerequisites: Consent of the instructor and the director of graduate studies.

## English as a Second Language (ESL)

**401. Teaching Methods for International Teaching Assistants. 1 to 3 Hours.** No graduation credit. S/U grade only. Basic communication and presentation skills for international teaching assistants. The culture of the American college classroom. Prerequisite: Score of 150 on the Test of Spoken English (TSE or Speak Test) and consent of the instructor. Students must obtain override from the instructor to register.

## Environmental and Occupational Health Sciences (EOHS)

### 400. Principles of Environmental Health Sciences. 3

**Hours.** Environmental influences on health: population, food, energy; community hygiene and injury control; solid/hazardous wastes, air and water pollution, radiation; industrial hygiene and occupational health. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

**405. Environmental Calculations. 1 Hour.** Problem-solving techniques as applied to environmental and occupational health: dimensional analysis, mass and energy balances, trial and error solutions, numerical and graphical techniques.

**411. Water Quality Management. 3 Hours.** Same as CEMM 412. Water pollution; historical and current developments in problems and solutions: characterization, water purification, waste treatment, modeling, standards and criteria, public health concerns. Prerequisite: EOHS 405 or consent of the instructor.

**418. Analysis of Water and Wastewater Quality. 2 Hours.** Same as CEMM 413. Basic instrumentation and procedures related to measurement and surveillance of various water quality parameters.

**421. Fundamentals of Industrial Hygiene. 2 Hours.** Recognition, evaluation, control of chemical, biological, and physical agents in the workplace. Application to preliminary surveys, measurement of exposure, and evaluation of control measures. Prerequisite: EOHS 400 or consent of the instructor.

**424. Environmental Acoustics. 2 Hours.** Fundamentals of noise generation/propagation; filtering; weighting; hearing biomechanics; health effects; audiometry; hearing control methods; sound fields; directivity; diffraction/barriers; regulations; instrumentation; control. Prerequisite: General college physics and ordinary calculus, or consent of the instructor.

**428. Industrial Hygiene Laboratory I. 2 Hours.** Detailed methods and experiments for measuring chemical, biological, and physical agents; and methods for evaluating the effectiveness of control measures. Prerequisites: EOHS 400, 405 and 421, or consent of the instructor.

**431. Air Quality Management I. 3 Hours.** Same as CEMM 419. Sources, control, dispersion and effects upon receptors of air pollution: health and other adverse effects, meteorology and dispersion estimation, photochemistry, aerosol characterization. Prerequisite: EOHS 405 or CEMM 216 or consent of the instructor.

**438. Air Quality Laboratory. 2 Hours.** Basic instrumentation and procedures related to measurement and surveillance of ambient air quality. Methods for collection and identification of gaseous and particulate pollutants. Prerequisite: EOHS 405 or consent of the instructor.

**440. Chemistry for Environmental Professionals. 3 Hours.** Same as CEMM 411. Introductory atmospheric chemistry, aspects of air pollution, chemistry related to natural water and water treatment; priority organic pollutants and heavy metals. Prerequisite: One year of college chemistry.

**450. Principles of Occupational and Environmental Medicine. 2 Hours.** Causes, transmission, control and prevention of the physical/chemical environmental stressors in the work environment; industrial processes and hazards, contrasts between developed and developing countries.

**455. Environmental and Occupational Toxicology. 3 Hours.** General and applied toxicology as it relates to environmental and occupational exposures to hazardous agents. Emphasis on basic principles, specific types of toxicity, and major classes of toxic agents. Prerequisites: Chem 232 and 234 and Bios 100 or the equivalent courses; or consent of the instructor.

**457. Principles of Toxicology. 2 Hours.** Same as Pcol 430. Examines the toxic effects of drugs and chemicals on organ systems. Lectures emphasize basic principles, effects on specific organ systems, major classes of toxic chemicals and specialized topics such as forensic and industrial toxicology. Prerequisite: Pcol 425 or consent of the instructor.

**461. Community Health and Consumer Protection. 2 Hours.** Prevention of health hazards due to infectious and chemical agents and physical processes, especially in the home and small

community environments; role of health agencies. Prerequisite: EOHS 400 or consent of the instructor.

**472. Management of Solid and Hazardous Wastes. 3 Hours.** Same as CEMM 423 and Geog 444. Management of solid and hazardous waste, including radioactive waste: landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

**474. Topics in Resource Management and Policy. 4 Hours.** Same as Geog 441. May be repeated for a maximum of 6 hours of credit. Selected topics dealing with environmental problems at local, regional or global levels. Topics vary. Prerequisite: Geog 341 or 361 or consent of the instructor.

**482. Occupational Safety Science. 2 Hours.** Principles of occupational safety, safety regulations, accident investigation procedures and engineering, behavioral, and administrative techniques for occupational accident control. Prerequisite: EOHS 421 or consent of the instructor.

**495. Environmental/Occupational Health Seminar. 1 Hour.** Discussions of current environmental health and occupational health topics, with presentations by students, faculty members, and visiting scientists.

**512. Water and Wastewater Treatment. 3 Hours.** Same as CEMM 522. Water and wastewater characterization: physical, chemical and biological methods of water and wastewater treatment; regulatory and control trends; and environmental impact determinations. Prerequisite: EOHS 411 or consent of the instructor.

**523. Engineering Controls/Ventilation. 4 Hours.** Design/evaluation of engineering control technology for workplace hazards: process modification, industrial ventilation, air cleaning, shielding, toxic air contaminants, mechanical hazards, (non)ionizing radiation, temperature. Prerequisites: EOHS 405, 421 and 428, or consent of the instructor.

**529. Industrial Hygiene Laboratory II. 2 Hours.** Field work: comprehensive industrial hygiene surveys of local work places. Health hazard analysis, design of sampling strategies, collection of field data, report preparation. EOHS 428 and 438, or consent of the instructor.

**532. Air Quality Management II. 2 Hours.** Same as CEMM 526. Air quality management: Integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. Prerequisite: EOHS 431.

**542. Water Chemistry. 3 Hours.** Same as CEMM 524. Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. Prerequisite: EOHS 440.

**543. Environmental Organic Chemistry. 3 Hours.** Same as CEMM 523. Properties and behavior of environmental organic pollutants. Theory and estimation techniques. Concepts of environmental fate assessment. Applications of fate models. Prerequisite: EOHS 440.

**551. Occupational Diseases. 4 Hours.** Diseases caused by physical, chemical, and biological agents in the workplace: toxicology, epidemiology, pathophysiology, diagnosis, treatment, prevention, high risk populations, early detection.

**554. Occupational and Environmental Epidemiology. 2 Hours.** Same as Epid 554. Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards. Prerequisites: Epid 401, Bstt 401 and EOHS 400; or consent of the instructor.

**556. Risk Assessment in Environmental and Occupational Health. 2 Hours.** Methodologies for utilizing toxicological and epidemiological data to estimate risks of pathology and expected number of cases due to exposures to pollutants in environments. Prerequisites: EOHS 405, Bstt 401, and Epid 400, or consent of the instructor.

**558. Industrial Toxicology. 2 Hours.** Clinical toxicology and mechanisms of workplace toxicants: metals, fibers, dusts, and organics. Diagnosis and treatment. Prerequisite: EOHS 400 and 457.

**570. Hazardous Materials Management. 3 Hours.** Definition and application of methods for managing hazardous materials: site health and safety plan development; remediation technique evaluations; incinerator design; computerized hazard response

program applications. Prerequisites: EOHS 405, 421, and 428; or consent of the instructor.

**575. Management of Land and Urban Resources. 3 Hours.** Same as Geog 514. Man's use and misuse of the land environment with emphasis on densely populated metropolitan areas. Health, physical, social, economic aspects. Land use models and simulations. Prerequisite: EOHS 400 or Geog 441 or consent of the instructor.

**584. Radiation Protection. 3 Hours.** Radioactivity, energetics, kinetics, interactions, external protection, dosimetry, recommendations and standards, measurement, radon. Prerequisite: EOHS 405 or consent of the instructor.

**594. Advanced Special Topics in Environmental Health. 1 to 4 Hours.** Environmental/occupational topics of current importance to public health: pollution, industrial hygiene, and related topics. Variable course contents arranged to supplement the existing curriculum. Prerequisite: Consent of the instructor.

**597. Advanced Laboratory Projects in Environmental Health. 1 to 4 Hours.** Application and integration of sampling and measurement techniques for characterization of inside and ambient environments. Individuals or groups supervised by EOHS faculty members. Prerequisite: Consent of the instructor.

## **Epidemiology (Epid)**

**400. Principles of Epidemiology. 3 Hours.** Introduction to descriptive and analytic epidemiology, determinants of health and disease in populations, and application of the epidemiologic methods to disease control; includes use of basic epidemiologic software. Prerequisite: Credit or concurrent registration in Bstt 400 or consent of the instructor. Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

**401. Quantitative Methods in Epidemiology I. 2 Hours.** Design and analysis of cohort and case-control studies, through stratified analysis. Bias, confounding and interaction effects will be closely examined. Prerequisites: Epid 400 and Bstt 400, or consent of the instructor.

**402. Quantitative Methods in Epidemiology II. 2 Hours.** Advanced statistical analysis for case-control and cohort studies. Includes analysis for trend, pair matching, life-tables, sample size and power, and logistic and Poisson regression. Prerequisites: Epid 401 and credit or concurrent registration in Bstt 401 or consent of the instructor.

**405. Human Growth and Nutrition. 3 Hours.** Same as Anth 405. Worldwide variation in human growth and the factors that contribute to differences between populations and individuals in the timing and pattern of growth and development.

**409. The Epidemiology of HIV/AIDS. 2 Hours.** Review of the HIV/AIDS pandemic and the global response to it focusing on patterns of transmission, risk factors and prevention/intervention. Prerequisite: Epid 400 or consent of the instructor.

**410. Epidemiology of Infectious Diseases. 2 Hours.** Epidemiology of selected infectious diseases, including incidence, prevalence and control of disease. Epidemic investigation is emphasized. Prerequisite: Epid 400 or consent of the instructor.

**411. Epidemiology of Chronic Diseases. 3 Hours.** Selected topics in chronic diseases with critical analysis of current epidemiologic literature. Prerequisite: Epid 400 or consent of the instructor.

**412. Introduction to Psychosocial Epidemiology. 2 Hours.** Reviews landmark studies of psychosocial and psychiatric disorders in U.S. communities; evaluates research methodology, case definition, identification, and empirical findings. Prerequisite: Epid 400 or consent of the instructor.

**428. Epidemiology of Violence. 2 Hours.** Reviews public health aspects of violence-related mortality and morbidity, examines existing data bases and conceptual frameworks focusing on etiology, epidemiology, surveillance and prevention. Prerequisite: Epid 400 or consent of the instructor.

**471. Population. 4 Hours.** Same as Soc 471. The measurement and study of major trends and differentials in fertility, mortality, migration, growth, and compositional characteristics of the population of the United States and other nations. Prerequisite: 6 hours of upper-division sociology, including Soc 201 or consent of the instructor.

**494. Introductory Special Topics in Epidemiology. 1 to 4 Hours.** Special topics in infectious or chronic disease epidemiology. Course content will vary from semester to semester. Prerequisite: Epid 400 or consent of the instructor.

**501. Advanced Quantitative Methods in Epidemiology. 3 Hours.** Advanced quantitative methods used in the analysis of case-control and cohort studies, including computer applications. Prerequisites: Epid 401 and Bstt 401, or consent of the instructor.

**510. Advanced Epidemiology of Infectious Diseases. 2 Hours.** Controversies regarding the etiology, transmission and prevention of selected infectious diseases. Literature reviews and study designs developed by students are a prominent part of course. Prerequisite: Epid 410 or consent of the instructor.

**513. Epidemiology of Aging. 2 Hours.** Current methodologic and public health issues in the epidemiology of aging will be explored. Prerequisites: Epid 401 or 411 and consent of the instructor.

**514. Epidemiology of Neurological Diseases. 2 Hours.** Fundamental concepts of neuroepidemiology are reviewed and descriptive, observational and experimental studies for major neurological diseases are presented. Prerequisite: Epid 411.

**515. Survey of Cancer Epidemiology. 2 Hours.** Survey of cancer epidemiology including nomenclature, mechanisms, descriptive data, analytic methods, etiology, prevention and control. Prerequisites: Epid 401 and 411 or consent of the instructor.

**516. Advanced Cancer Epidemiology. 2 Hours.** Critical review of the epidemiology of selected cancer sites to promote synthesis of knowledge, awareness of methodologic issues, and stimulate future research. Prerequisites: Epid 515 and 501, or consent of the instructor.

**517. Epidemiology of Cardiovascular Diseases. 2 Hours.** Epidemiology and risk factors of cardiovascular diseases. Prerequisite: Epid 411 or consent of the instructor.

**518. The Epidemiology of Pediatric Diseases. 3 Hours.** Familiarizes the student with issues unique to research on children. Lecture topics include epidemiology of childhood diseases, important research studies, and methodologic problems specific to studying children. Prerequisites: Epid 401 and Bstt 400 or consent of the instructor.

**519. Research Protocol and Grant Development. 1 Hour.** Satisfactory/Unsatisfactory grade only. A review of funding options and examples of developing fundable research proposals. Prerequisite: Epid 400.

**520. Genetics in Epidemiology. 2 Hours.** Topics in genetic/molecular epidemiology, including genetics, population genetics, molecular biology, molecular genetics. Familiarizes students with laboratory/statistical concepts and applications in epidemiological studies. Prerequisite: Epid 401 or consent of the instructor.

**545. Reproductive and Perinatal Health. 3 Hours.** Same as CHSc 545. This course focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. Prerequisites: Bstt 400 and CHSc 400 and Epid 400 and consent of the instructor.

**554. Occupational and Environmental Epidemiology. 2 Hours.** Same as EOHS 554. Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards. Prerequisites: Epid 401, Bstt 401 and EOHS 400; or consent of the instructor.

**591. Current Epidemiologic Literature. 2 Hours.** S/U grade only. Student presentation of recently published scientific papers of epidemiologic interest, to promote breadth of knowledge and critical examination of evidence. Prerequisite: Epid 401 or consent of the instructor.

**594. Advanced Special Topics in Epidemiology. 1 to 4 Hours.** Special topics in infectious or chronic disease epidemiology or epidemiologic methods. Course content will vary from semester to semester. Prerequisite: Epid 401 or consent of the instructor.

**595. Epidemiology Research Seminar. 1 to 2 Hours.** S/U grade only. Thesis research of graduating students and ongoing research by faculty and outside guests will be presented and critically evaluated. Prerequisite: Epid 400 or consent of the instructor.



## Finance (Fin)

**412. Portfolio Management. 3 Hours.** Development of portfolio theory; establishment of portfolio objectives for individuals, corporations, banks, pension and mutual funds; evaluation of portfolio performance. Prerequisite: Fin 310.

**414. Security Analysis. 3 Hours.** Interpretation and analysis of published financial statements for internal control and external evaluation; the financial characteristics of industrial, commercial, financial, transportation, public utility, real-estate, and nonprofit institutions. Prerequisite: Fin 310.

**415. Fixed Income Securities. 3 Hours.** Valuation of fixed income securities, term structure estimation and arbitrage trading with practical application using real data. Prerequisite: Fin 310.

**416. Options and Futures Markets. 3 Hours.** History and institutional structure of options and futures markets. Uses of futures and options for arbitrage, speculation, and hedging by managers of domestic and multinational organizations. Analysis of factors that determine futures and options prices. Prerequisite: Fin 310.

**420. Corporate Financial Strategy. 3 Hours.** Economic and legal factors (market dominance, oligopolistic markets, antitrust policy); organizational and behavioral factors in decision making; managerial leadership; impact of information systems and accounting policy; case studies. Prerequisite: Fin 320.

**430. Introduction to Money and Banking. 3 Hours.** Payment and banking systems; credit and market risk management; The Federal Reserve System; globalization of monetary, banking, and regulatory systems. Prerequisite: Fin 300.

**431. Theory and Structure of Financial Markets. 3 Hours.** The distribution of saving and credit over time and risk categories. The financial services industry. Administration and regulation of global money, security, and derivatives markets. Prerequisite: Fin 300.

**442. International Finance. 3 Hours.** Financial management within an international context. International monetary system and financial markets, management of foreign investments, working capital management, exchange risks, taxation, and earnings reports. Prerequisites: Fin 300 and 310.

**444. Small Business Finance. 3 Hours.** Aspects of acquiring funds for small business enterprises. Topics include the trade-off of liquidity and profitability, management of working capital, and capitalization. Prerequisite: Fin 300.

**465. Property and Liability Insurance. 4 Hours.** Using property and liability insurance to manage risk. Topics may include fire, marine, consequential loss, crime, title, automobile, and workers' compensation insurance. Prerequisite: Fin 300 or consent of the instructor.

**466. Life and Health Insurance. 4 Hours.** Types, uses, and evaluation of life and health insurance. Economics of the industry. Regulation and taxation. Prerequisite: Fin 300 or consent of the instructor.

**472. Real Estate Finance. 3 Hours.** Same as Econ 472. Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. Prerequisite: Fin 300.

**494. Special Topics in Finance. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Content, prerequisites, and course of study will vary according to the instructor. Prerequisite: Consent of the instructor.

**495. Competitive Strategy. 4 Hours.** Multidisciplinary analysis of organization strategy and policy using case method and/or business simulation. Assignments involve extensive library research as well as oral and written reports. Prerequisite: Consent of the instructor.

**500. Introduction To Corporate Finance. 4 Hours.** No credit given if the student has credit in MBA 504. Theory of corporate finance: goal of the firm, time value of money, investment decisions (under certainty and uncertainty), net present value, capital markets, and corporate financing decisions. Prerequisites: Actg 500 and Econ 520.

**510. Investments. 4 Hours.** Theory and practice of investment analysis. Topics included are the institutional organization of security markets, and fundamental principles of asset valuation with application to specific securities. Prerequisite: Fin 500.

**512. Portfolio Analysis. 4 Hours.** Development of portfolio

theory; establishment of portfolio objectives; evaluation of portfolio performance; investment objectives for individuals, corporations, banks, pension and mutual funds, and their interrelation with economic environment. Prerequisite: Fin 510.

**516. Theory and Structure of Options and Futures Markets. 4 Hours.** History and institutional structure of options and futures markets. Uses of futures and options for arbitrage, speculation and hedging by financial and production managers of domestic and multinational organizations. Analysis of factors that determine futures and options prices. Prerequisite: Fin 510.

**520. Corporate Finance. 4 Hours.** Advanced topics in corporate finance including capital structure, dividend policy, financial restructuring, bankruptcy, and leasing. Emphasis on recent developments in corporate finance and financial economics. Prerequisite: Fin 500.

**522. Applications of Corporate Finance. 4 Hours.** Application of corporate financial theory to business problems. Lectures on special topics and the presentation, analysis, and critique of cases. Prerequisite: Fin 520.

**530. Money and Banking. 4 Hours.** The functions of money; monetary standards; development and operation of commercial banking and the Federal Reserve System. Theories of the supply and demand for money; effects of monetary changes on economic activity, interest rates, and income. Prerequisite: Fin 500.

**531. Capital Markets. 4 Hours.** Capital markets in the private economy. The flow of funds in financial markets and financial intermediaries. The pricing of securities. Short-term money markets and the Federal Reserve System. The market for long-term securities. Financial markets and the stability and progress of the economy. Prerequisite: Fin 500.

**542. International Finance. 4 Hours.** Financial management within an international context. International monetary system, exchange rates, foreign investments, working capital management, financing trade, taxation, and earnings reports. Prerequisite: Fin 510.

**544. Entrepreneurial And New Venture Financing. 4 Hours.** The financing of new business. Estimating cash needs and then determining sources to finance them. This course is designed for those wanting to start their own business. Prerequisite: Fin 500.

**551. Financial Decision Making I. 4 Hours.** First foundation course for the study of modern financial economics. Two-period individual consumption and portfolio decisions under uncertainty and their implications for the valuation of securities. Prerequisite: Consent of the instructor.

**552. Financial Decision Making II. 4 Hours.** Second foundation course in the study of modern financial economics. Discrete and continuous time stochastic process models of securities, arbitrage, option pricing, optimal portfolios, consumption-investment problems. Prerequisite: Fin 551.

**553. Financial Decision Making III. 4 Hours.** Third foundation course in the study of modern financial economics. Informational issues, incentives problems, and strategic decision making in finance. Prerequisite: Fin 551.

**559. Advanced Theory of Options and Futures Contracts. 4 Hours.** Fundamentals of American and European puts and calls: arbitrage, trading strategies, and Black-Scholes formula. Futures markets: equilibrium, arbitrage, statistical properties, hedging, options on futures. Prerequisite: Consent of the instructor.

**561. Theory of Corporate Finance. 4 Hours.** Intensive review of the modern theory of corporate finance, emphasizing the integration of firm investment, financing, and dividend decisions with capital market equilibrium. Prerequisite: Consent of the instructor.

**567. Money and Financial Intermediation. 4 Hours.** The history, development, contemporary structure, and regulation of domestic and international money, capital markets and institutions. Emphasis is placed on theoretical analysis of models of the behavior of market participants and forecasts of interest rates. Prerequisites: Fin 500 and consent of the instructor.

**571. Empirical Issues in Finance. 4 Hours.** The methodology used in analyses of market efficiency, asset pricing and capital allocation. Prerequisites: Fin 500 and consent of the instructor.

**581. Workshop on Financial Decision Making. 4 Hours.** Individual's portfolio consumption problem, multiperiod equilibrium in markets, pricing of contingent claims, the term structure of interest rates. Prerequisites: Fin 552 and 553.



**582. Workshop on Corporate Finance. 4 Hours.**

Exploration of the interaction between the financial system and real business activity, both within a closed system and an open economy. Prerequisite: Fin 561.

**583. Workshop on Empirical Issues in Finance. 4 Hours.**

A seminar on special topics in empirical work in finance. Prerequisite: Fin 571.

**584. Workshop on Money and Financial Intermediation. 4 Hours.**

The systematic analysis and presentation of research monographs on the subject of domestic and international money and capital markets, including their participants, regulators, and price behavior. Prerequisite: Fin 567.

**594. Special Topics in Finance. 4 Hours.** Selected topics in finance. Topics vary. Prerequisite: Consent of the instructor.

**596. Independent Study in Finance. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per semester. Independent study under the direction of a faculty member. Must be arranged before the start of the semester. Prerequisite: Consent of the department head or instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research on topic approved for doctoral dissertation under supervision of faculty advisor. Prerequisite: Consent of the instructor.

## French (Fr)

**401. Reading French for Graduate Students. 4 Hours.**

Taught in English. Credit may not be applied toward a graduate degree. Grammar, vocabulary, general and specialized reading practice; for graduate students wishing to fulfill French reading requirements for the PhD. Prerequisites: Some prior experience with elementary French recommended, and consent of the instructor.

**410. French Feminist Theory. 4 Hours.**

Same as GWS 410. Taught in English. May be used for credit in the French major with the consent of the instructor. An introduction to French feminist theory, in particular feminist theories influenced by Lacanian psychoanalysis. Prerequisite: Fr 301 or Fr 302 or consent of the instructor.

**415. French Literature of the Middle Ages. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Introduction to major medieval genres (epic, romance, lyric, theater, allegory) works and authors, such as le Chanson de Roland, Tristan, Chretien de Troyes, Marie de France, Villon. Prerequisite: Fr 301 or consent of the instructor.

**416. Topics in Sixteenth-Century French Literature. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Intensive analysis of Renaissance literature (Rabelais, Montaigne, Marguerite de Navarre, poetry of the Pleiade, etc.) in the cultural context of Humanism and the Reformation. Prerequisite: Fr 301 or consent of the instructor.

**417. Topics in Seventeenth-Century French Literature. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Intensive study of Baroque and Classicism, with focus on major genres: theater (Corneille, Moliere, Racine); poetry (La Fontaine); prose (Pascal, de Seigne); novel (de Lafayette). Prerequisite: Fr 301 or consent of the instructor.

**418. Topics in Eighteenth-Century French Literature. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Introduction to the literature and philosophy of the Enlightenment through representative authors (Rousseau, Diderot, etc.) and major genres (novel, essay, conte, theater, etc.). Prerequisite: Fr 301 or consent of the instructor.

**419. Topics in Nineteenth-Century French Literature. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Major genres and works from Romanticism to realism, naturalism, and symbolism will be studied within the context of the social, cultural and political movements of the century. Prerequisite: Fr 301 or consent of the instructor.

**420. Topics in Twentieth-Century French Literature. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Study of major literary movements (surrealism, existentialism, nouveau roman, theater of the absurd) and intensive analysis of works by major authors from Proust to Beckett. Prerequisite: Fr 301 or consent of the instructor.

**422. Francophone Novel. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Intensive analysis of a topic in Francophone literature. Scope includes Quebec, Africa, the Antilles, and

French novelists outside of France. Prerequisite: Fr 301 or consent of the instructor.

**433. Advanced Oral and Written French. 4 Hours.**

Exercises in French pronunciation; oral interpretation of different texts (familiar style and formal discourse); discussion of newspapers, magazine articles; practice in critical writing. Prerequisite: Fr 334 or consent of the instructor.

**446. Methods and Principles of Translation. 4 Hours.**

Techniques and intensive practice in English-French and French-English translation. Varied texts range from literary passages to expository prose. Prerequisite: Fr 232 or consent of the instructor.

**461. French Civilization I: Medieval and Renaissance. 4 Hours.**

Lectures and discussion in French. Interdisciplinary approach to French civilization of the Middle Ages and the Renaissance including history, literature, the beaux-arts, and philosophy. Prerequisite: Fr 302 or consent of the instructor.

**462. French Civilization II: Seventeenth and Eighteenth Centuries. 4 Hours.**

Lectures and discussion in French. Interdisciplinary approach to French civilization of the seventeenth and eighteenth centuries including history, literature, the beaux-arts, and philosophy. Prerequisite: Fr 302 or consent of the instructor.

**463. French Civilization III: Nineteenth and Twentieth Centuries. 4 Hours.**

Lectures and discussion in French. An interdisciplinary approach to French civilization of the nineteenth and twentieth centuries, including history, literature, beaux-arts, and philosophy. Prerequisite: Fr 302 or consent of the instructor.

**464. Topics in French Civilization. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. An interdisciplinary approach to French civilization, including history, literature, beaux-arts, and philosophy. Each topic focuses on a specific period between the Middle Ages and the present. Prerequisite: Fr 302 or consent of the instructor.

**470. Educational Practice with Seminar I. 6 Hours.**

Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**471. Educational Practice with Seminar II. 6 Hours.**

Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Fr 470, and approval of the department.

**481. Foreign Language Teaching Methodology. 4 Hours.**

Same as Span 450 and Ital 460. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisite: Three courses at the 200 and 300 levels.

**496. Independent Study. 1 to 4 Hours.**

Supervised study in an area not covered by regularly scheduled courses under the direction of a faculty member designated by the chairperson of the department. Prerequisites: French major and consent of the department.

**502. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours.**

Same as Span 502. No credit given if student has credit in Span 450 or Fr 450 or Ger 407. This course introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice. Taught in English. Prerequisite: Appointment as a teaching assistant. For students outside the department: consent of the instructor.

**510. Seminar in Literary Studies. 4 Hours.** May be repeated for credit; beyond 12 hours of credit, consent of the director of graduate studies required. Topics vary.

**530. Seminar in Language Studies. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Topics vary.

**531. Explication de Textes. 4 Hours.** Lectures, discussion, and student explications. Detailed critical and stylistic analysis of selected short pieces of French prose and poetry.

**560. Seminar in Cultural Studies. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Topics vary.

**575. French Abroad. 0 to 16 Hours.** May be repeated for a maximum of 33 hours of credit. Lectures, seminars and practical work in francophone literature and civilization in France. Prerequisite: Consent of the department.

**596. Independent Study. 1 to 4 Hours.** Supervised study in an area not covered by regularly scheduled courses under the direction of a faculty member designated by the chairperson of the department. Prerequisites: Graduate standing in French and approval of the department.

**598. Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for a maximum of 8 hours of credit. Prerequisite: Approval of the director of graduate studies.

## Gender and Women's Studies (GWS)

[Previous name and rubric: Women's Studies (WS)]

**403. Culture and Sexuality: Cultural History of Same-Sex Relations. 4 Hours.** Lesbian/gay studies; issues in the history of (homo)sexuality; cultural and historical analysis of same-sexuality in several periods, including our own.

**410. French Feminist Theory. 4 Hours.** Same as Fr 410. Taught in English. May be used for credit in the French major with the consent of the instructor. An introduction to French feminist theory, in particular feminist theories influenced by Lacanian psychoanalysis.

**412. Women and the Environment. 4 Hours.** Same as Arch 412. Women's place in the built environment; the role of gender in environmental experience including women as users, designers, planners, policy makers, and critics.

**419. Public Health Aspects of Sexuality and Women's Health. 3 Hours.** Same as CHSc 419. An overview of human sexuality from a public health view with special emphasis on family planning, sexuality, and behavior effects on women's health.

**424. Gender, Crime, and Justice. 4 Hours.** Same as CrJ 424. An in-depth examination of the etiology of female crime and the involvement of females in the criminal justice system as offenders, victims, and workers/professionals. Prerequisites: CrJ 101 and 220 or consent of the instructor.

**425. Sociology of Gender. 4 Hours.** Same as Soc 424. Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family; economy. Prerequisite: 6 hours of upper-division sociology or gender and women's studies courses or consent of the instructor.

**439. Gender and Cultural Production. 4 Hours.** Same as Ger 439. May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. Taught in English. Students who intend to use Ger 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

**441. Introduction to Maternal and Child Health. 3 Hours.** Same as CHSc 441. Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. Prerequisite: Consent of the instructor. Recommended background: Some knowledge of maternal and child health issues.

**450. Women and Mental Health Nursing. 3 Hours.** Same as NuPs 450 and NuSc 450 and NuWH 450. Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. Prerequisite: Consent of the instructor.

**456. Language and Gender. 4 Hours.** Same as Ling 456. Examination of current sociolinguistic research and theories on the function of sex categories in linguistic systems and male-female differences in patterns of linguistic usage. Prerequisite: Ling 405 or consent of the instructor.

**469. Women's Literary Traditions. 4 Hours.** Same as Engl 469. An exploration of issues such as the female aesthetic; women's popular literature; factors that enable creativity; differences of race and class.

**470. Reading Black Women Writing. 4 Hours.** Same as AAsT 470 and Engl 480. Examines inscriptions of race, gender, class,

and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. Prerequisite: AAsT 110 or 111 or 250 or consent of the instructor.

**472. Women and Film. 4 Hours.** Same as AH 434 and Engl 472. Roles and representations of women in classical Hollywood, European art and independent feminist cinemas. Prerequisite: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**474. History and Archives. 4 Hours.** Same as Hist 474. Introduction to archival preservation and management. Under faculty supervision, students will create a records management plan for an organization to preserve documents of historical importance. Includes internship at an external agency. Prerequisite: 3 hours of history or consent of the instructor.

**478. Women in Chinese History. 4 Hours.** Same as AsSt 478 and Hist 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution and the historiography of the field.

**484. Topics in the History of Women. 4 Hours.** Same as Hist 484. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or gender and women's studies or consent of the instructor.

**485. Gender and Politics. 4 Hours.** Same as PolS 485. Impact of gender on basic categories of Western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. Prerequisites: PolS 190 and one 200-level course in political theory, or consent of the instructor.

**490. Advanced Topics in the Study of Sexuality. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Special study at an advanced level of a topic concerning sexuality. Prerequisite: 3 hours in gender and women's studies or consent of the instructor.

**494. Advanced Topics in Women's Studies. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specialized study of a problem, topic or issue relevant to the interdisciplinary area of gender and women's studies at the advanced level. Content varies.

**501. Feminist Theories. 4 Hours.** An analysis of important trends in historical and contemporary feminist theories.

**502. Feminist Methodologies. 4 Hours.** An exploration of feminist methodologies and pedagogy from an interdisciplinary perspective.

**514. Gender Issues in Cross-Cultural Perspective. 4 Hours.** Same as Anth 514. Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. Prerequisite: Anth 500, or consent of the instructor.

**515. Theoretical Perspectives on Women and Gender. 3 Hours.** Same as Psch 515. Critical examination of psychological theories and research on women and gender, including biological, psychoanalytic, socialization, power, and social constructionist perspectives. Prerequisite: Graduate standing in Psychology or GWS 315 and consent of the instructor.

**525. Social Work with Women. 3 Hours.** Same as SocW 525. Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. Prerequisites: SocW 410; or consent of the instructor.

**547. Race, Class, and Gender Dimensions of Crime and Justice. 4 Hours.** Same as CrJ 547. Theories addressing the intersections of race, class, gender, crime and justice. Specifically, students examine criminological theories, social construction of race, class, and gender, legal decision-making, and implications of this for justice in our society.

**552. Economic Demography. 4 Hours.** Same as Econ 552. Economic analysis of fertility (number and timing of children), mortality, marriage and divorce, population age structure, the relationship between population growth and economic development. Prerequisite: Econ 501 or 520.

**583. Women in Education. 4 Hours.** Same as PS 583. An overview of girl's and women's educational experiences and placement within the academic structure (as students, professionals and intellectuals). The impact of gender on the realization of educational, economic and social opportunities. Prerequisite: Consent of the

instructor, or enrollment in the PhD in policy studies in urban education program.

**594. Special Topics in Gender and Women's Studies. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Study of a problem, topic or issue relevant to the interdisciplinary area of gender and women's studies. Content varies. Prerequisite: Consent of the instructor or one course in gender and women's studies.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Topics and plan of study must be approved by the instructor. Prerequisite: Consent of the instructor.

## Geography (Geog)

**401. Topics in Regional Geography. 4 Hours.** May be repeated for a maximum of 6 hours of credit. Geographic analysis of cultural and environmental systems of a political, economic, or climatic region of the world as defined by the instructor. Prerequisites: One upper-division course in each of the areas of skills, systematic and regional/urban geography.

**411. Areal Organization of Urban Systems. 4 Hours.** The physical, economic, social, and political aspects of the internal patterns and external arrangements of cities in the Western world. Prerequisite: One 200-level course in either urban or economic geography.

**421. Systematic Climatology. 4 Hours.** Emphasis on fluxes of energy and mass at the earth-atmosphere interface; climatic environment of the biosphere including the urban water budget. Prerequisite: Geog 221 or consent of the instructor.

**431. Advanced Landform Geography. 4 Hours.** Genesis of surficial landforms and processes that sculpt them. Prerequisite: Geog 131 or Geol 101 or consent of the instructor.

**432. Geomorphology and Archaeology. 4 Hours.** Same as Anth 421. Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geoarchaeology. Prerequisite: Geog 131 or Geol 101 or consent of the instructor.

**441. Topics in Resource Management and Policy. 4 Hours.** Same as EOHS 474. May be repeated for a maximum of 6 hours of credit. Selected topics dealing with environmental problems at local, regional or global levels. Topics vary. Prerequisite: Geog 341 or 361 or consent of the instructor.

**442. Environmental Hazards and Risks. 4 Hours.** Environmental risks of natural and technological hazards; causes and consequences to people; social theories of risks; coping mechanisms used to reduce risk. Prerequisite: Geog 251 or 441 or consent of the instructor.

**444. Management of Solid and Hazardous Wastes. 3 Hours.** Same as EOHS 472 and CEMM 423. Management of solid and hazardous waste, including radioactive waste: landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

**453. Seminar in Cultural Ecology. 4 Hours.** Same as Anth 453. Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture. Prerequisite: Anth 101 or Geog 151 or consent of the instructor.

**461. Location and Land Use. 4 Hours.** Environmental, demographic, and institutional influences on land availability/use at global/local scales; geographies of production/use intensity; market/governmental controls over land/users. Prerequisite: Geog 361 or consent of the instructor.

**464. Geographic Modeling of Transportation Systems. 4 Hours.** Discussions of the principles of spatial interaction, emphasizing passenger movements, commodity flows, the practicality of network analysis, and the impact of transportation facilities on land use and regional development. Prerequisites: Geog 100 and 161.

**470. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program,

completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**471. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Geog 470, and approval of the department.

**472. The Learning and Teaching of Geography. 3 Hours.** A consideration of instructional strategies in teaching geographical content, with regard for known behavioral and learning characteristics of students. Emphasis is on material presentation in contemporary urban schools. Prerequisite: Declared major in teacher education.

**475. Thematic Cartography. 4 Hours.** Discussion and projects involving representation of real-world areal patterns; preservation of geodetic, locational and informational relationships; information generalization and reconstruction; computer software, and programs for computer-assisted cartography. Prerequisite: Geog 276 or 278 or consent of the instructor.

**478. Mapping with Microcomputers. 4 Hours.** Same as Anth 484. Microcomputer applications including computer principles for mapping, alternative design for coordinate files, kinds of devices for mapping, direct control of devices for mapping, characteristics and limitations of mapping programs. Prerequisite: Geog 475 or consent of the instructor.

**481. Geographic Information Systems I. 4 Hours.** Same as Anth 481. Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files. Geocoding. Prerequisites: Geog 100 and one from Geog 278 or 386 or IDS 100, or consent of the instructor.

**482. Geographic Information Systems II. 4 Hours.** Same as Anth 482. Application of inferential statistical techniques and probability models in geographic research. Topics include use of descriptive parameters in recognizing geographic relationships, tests of significance, and recognition of areal patterns. Prerequisite: Geog 481 or consent of the instructor.

**483. Geographic Information Systems III. 4 Hours.** Same as Anth 483. Problems encountered in the analysis and portrayal of geographic data. Topics include taxonomy, regionalization, trend surface analysis, time series, markov probabilities, and computer cartographic procedures for displaying output from analytic procedures. Prerequisite: Geog 482 or consent of the instructor.

**484. Qualitative Methods in Geographic Research. 4 Hours.** Use of qualitative methods in geographic research. Research design choices, data collection and analysis, writing. Applications in environmental and urban geography. Prerequisite: Geography major or minor or Geog 481 or consent of the instructor.

**486. Analysis of Geographic Patterns. 4 Hours.** Analytical methods for evaluating arrangements of points, lines and subareas across regions. Development of noncentral measures of spatial association as an alternative to correlation analysis. Prerequisite: Geog 482 or consent of the instructor.

**491. History and Philosophy of Geography. 4 Hours.** The philosophy of geography, its theory and research techniques. Analysis of bibliographic sources; criticism of papers on assigned topics. Prerequisite: Declared major or minor in geography or consent of the instructor.

**496. Internship in Geography. 1 to 3 Hours.** Only 3 hours of credit may be counted toward the research requirement in the MA thesis program. Professional field experience with an agency or organization in the private or public sector on projects related to the student's area of specialization. Prerequisites: Declared major or full graduate standing in geography and consent of the faculty advisor and the director of internship programs.

**505. Seminar on the Geography of Colonialism and Neocolonialism. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Colonialism: historical, political and development geographies. Colonialism in the evolution of Europe and the Third World. Anticolonial liberation movements. Theories of neocolonialism, underdevelopment, dependency. Prerequisite: Geog 353 or 401 or consent of the instructor.



**511. Topics in Urban Geography. 3 Hours.** May be repeated for a maximum of 9 hours of credit. Critical analysis of selected theories, methods and problems of urban and settlement geography. Prerequisite: One 400-level course in urban, economic, or transportation geography.

**530. Seminar in Physical Geography. 3 Hours.** May be repeated for a maximum of 6 hours of credit. General topic to be defined by instructor; specific approved topic to be defined, researched and discussed by student. Prerequisite: Geog 431 or 421 or consent of the instructor.

**541. Seminar on Resource Management and Policy. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Social policy issues in the resolution of resource management conflicts. Topics will vary. Prerequisite: Geog 441 or 461 or consent of the instructor.

**551. Research Seminar on the Ecology of Mapping Behavior. 4 Hours.** Mapping behavior examined cross-culturally, historically, and developmentally. Ecological functions of mapping in macro-spatial behavior. Prerequisite: Consent of the instructor.

**575. Seminar in Cartography. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Review of recent developments in computer mapping and identification of mapping needs. Research on conceptual and program solutions to computer mapping problems. Prerequisites: Geog 475 and Geog 481; or consent of the instructor.

**589. Geographic Information Systems for Planning. 4 Hours.** Same as UPP 508. Applications of Geographic Information Systems to urban planning and policy making. Prerequisite: Graduate standing in urban planning and policy or consent of the instructor.

**592. Research Proposal Design. 1 Hour.** Research techniques, including problem definition, literature search, and methodological design. Prerequisite: Geog 595.

**595. Departmental Seminar. 3 Hours.** S/U grade only. Review of contemporary geographic theory in academic research and professional practice. Prerequisite: Graduate standing in geography.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Independent research on approved topic not related to thesis preparation. Prerequisite: Consent of the faculty advisor and the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for a maximum of 16 hours of credit. Independent research on a topic approved for a graduate thesis. Prerequisite: Consent of the thesis research advisor.

## Germanic Studies (Ger)

**400. German for Reading Knowledge. 4 Hours.** Credit may not be applied toward a degree or minor offered by the Department of Germanic Studies. Does not satisfy the graduation requirement in foreign languages. Preparation for the Graduate Proficiency Exam. Basic components of German grammar, sentence structure, and vocabulary. Selected texts in humanities, social sciences, and natural sciences.

**401. Advanced Practice in German Language Skills. 4 Hours.** Majors and minors outside the Department of Germanic Studies may repeat this course for a maximum of 6 hours of credit. Communicative use of German techniques for understanding written and spoken texts, practicing conversation and writing texts such as essays, compositions, letters, and email. Area: language. Prerequisite: Ger 212 or the equivalent.

**404. Yiddish for Reading Knowledge. 4 Hours.** Basic components of Yiddish grammar, sentence structure, and vocabulary. Selected texts in the original language will be studied. Preparation for the Graduate Proficiency Exam. Prerequisite: Ger 211 or consent of the instructor or graduate standing.

**407. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours.** This course focuses on theory and practice of communicative language teaching and explores current approaches of task-based instruction, testing, and media-enhanced instruction. Taught in English. Pedagogical examples are in German. Ten hours of high school observation required. Area: language. Prerequisite: Ger 212 or the equivalent.

**408. Introduction to Translation Theory. 4 Hours.** The study of translation theory and its application to translating German texts of various types into English. Appropriate for students who want to become translators. Area: language.

**411. The City as Cultural Focus. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Taught in English. No knowledge of German required. Students who intend to use Ger 411 toward a degree offered by the Department of Germanic Studies will do assignments in German. Interdisciplinary study of urban culture with focus on German-speaking countries. Area: literature/culture. Prerequisites: For majors and minors in the Department of Germanic Studies only: Ger 212 or the equivalent; or consent of the instructor.

**420. Germanic Cultural Studies I: Genres. 4 Hours.** May be repeated for a maximum of 12 hours of credit if topic is different for each registration. Concentration on a genre, with stress on cultural analysis and theoretical inquiry. Students who intend to use Ger 420 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

**421. Germanic Cultural Studies II: Authors, Movements, Periods. 4 Hours.** May be repeated for a maximum of 12 hours of credit if topic is different for each registration. Critical analysis of texts in the biographical, social, cultural, and historical context. Students who intend to use Ger 421 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

**422. Germanic Cultural Studies III: Themes. 4 Hours.** May be repeated for a maximum of 12 hours of credit if topic is different for each registration. Explores themes in German-speaking societies, such as the family, xenophobia, crime, and science, with stress on literary analysis and interpretation. Students who intend to use Ger 422 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

**430. Classical German Philosophy. 4 Hours.** Introduction to German philosophy and intellectual history through the critical analysis of major authors and texts. Prerequisite: one 300-level course in germanic studies or consent of the instructor.

**437. Contemporary Germanic Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Literature of the German-speaking world since World War II, with emphasis on current issues and recent critical approaches to literature. Area: literature/culture.

**438. The Faust Legend. 4 Hours.** Discusses Goethe's Faust within the context of European and non-European literatures. Traces the origins, significance, and interpretation of the Faust figure. Area: literature/culture.

**439. Gender and Cultural Production. 4 Hours.** Same as GWS 439. May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. Taught in English. Students who intend to use Ger 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

**450. Business Operations in German-Speaking Countries. 4 Hours.** The political, cultural, historical, and economic environment in which business operates in the German-speaking countries; the effects of this environment on international business. Knowledge of German not required.

**461. German Abroad. 0 to 17 Hours.** May be repeated for a maximum of 34 hours of credit. Taken in a German-speaking country. Lectures, seminars, and practical work in German language, literature, and civilization. Prerequisites: Ger 104 or the equivalent; a 2.75 overall grade point average and a 3.00 grade point average in German; and approval of the department.

**470. Exploring the Field of Germanic Studies. 4 Hours.** Team-taught. Research in film studies, gender studies, Jewish culture, minorities, literary studies, intellectual history, applied linguistics in germanic studies. Each unit taught by different faculty member from Department of Germanic Studies.

**490. Topics in Second Language Acquisition. 1 to 4 Hours.** May be repeated for credit. This course provides an overview of theory and research in one focus area of second language acquisition. Taught in English. Area: language. Prerequisite: Consent of the instructor.

**492. Internship in International Business. 0 to 12 Hours.** May be repeated for credit with approval of the department.



S/U grade only. Student placement in an international organization or firm in a German-speaking country or its U.S. subsidiary or division. Prerequisites: Ger 211; and a GPA of 2.00; and consent of the instructor.

**493. Internship Seminar: Business. 1 to 4 Hours.** May be repeated for credit with approval of the department. A maximum of 4 hours of credit may be applied toward a graduate degree offered by the Department of Germanic Studies. Academic component of the internship experience. Studies in the field of the internship and further investigation of related topics. Students will attend a seminar or submit frequent reports, depending upon remoteness of internship site. Prerequisite: Ger 211; and credit or concurrent registration in Ger 492; and a GPA of 2.00; and consent of the instructor.

**494. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**495. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Ger 494, and approval of the department.

**513. Germanic Culture from the Enlightenment to the 1848 Revolution. 4 Hours.** May be repeated for credit if topic is different for each registration. Representative works and authors studied in a cultural context.

**514. Germanic Culture from the Industrial Revolution to the Present. 4 Hours.** May be repeated for credit if topic is different for each registration. Representative works and authors are studied in a cultural context.

**515. Film and Media Culture. 4 Hours.** This seminar will explore the theory and history of film and other visual media. Emphasis will be given to the status of media texts in their cultural contexts, as well as to their function as components of modern social institutions. Taught in English. Students will be asked to watch films outside of class.

**531. Seminar in Special Topics. 4 Hours.** May be repeated for a maximum of 12 hours of credit if topic is different for each registration. In-depth study of a theme, genre or other element in Germanic literature and culture not confined to a single historical period. Topics vary.

**572. The Role of Reading in Second Language Acquisition. 4 Hours.** This course analyzes current theoretical and research directions in text comprehension processes as well as reading as a source of input for second language acquisition. Taught in English.

**593. Internship Seminar: Academic Training. 4 Hours.** Training in instruction of literature and culture courses at the college level. Students will be involved in a faculty-taught culture/literature course.

**596. Independent Study for Graduate Students. 1 to 4 Hours.** Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research under faculty supervision on a topic approved by the Graduate Program Committee. Prerequisites: Consent of the supervising faculty member and committee approval.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Prerequisites: Departmental approval and consent of the instructor.

## Graduate College (GC)

**401. Scientific Integrity and Responsible Research. 0 Hours.** S/U grade only. Meets during the first seven weeks of the term on the west side of campus, and on the east side of campus during the last seven weeks. Designed to meet NIH requirements for formal training in the responsible conduct of research. Ethical and legal issues in the conduct of research; University of Illinois at Chicago research standards, regulations, and procedures.

**470. Essentials for Animal Research. 1 Hour.** S/U grade only. This course will acquaint the students with the regulations, sources of information, humane principles, and ethical considerations involving the appropriate use of animals for research and teaching purposes.

**471. Experimental Animal Techniques. 2 Hours.** Animals used in instruction. S/U grade only. Noninvasive and invasive techniques commonly used in laboratory animals are performed with emphasis placed upon the proper use of anesthetic, analgesics, and aseptic techniques. Prerequisite: GC 470.

**473. Seminar in Comparative Medicine. 1 to 2 Hours.** S/U grade only. Selected fields of interest and research in comparative medicine will be presented in the areas of comparative biology, model development and experimental techniques. Prerequisite: GC 471 or consent of the instructor.

**491. Graduate Study Abroad. 0 to 16 Hours.** May be repeated for a maximum of 32 hours of credit. Lectures, seminars, and independent travel/study abroad in conjunction with an approved graduate program. Prerequisites: Approval of the Graduate College.

## Health Policy and Administration (HPA)

**400. Principles of Management in Public Health. 3 Hours.** A detailed discussion of the conceptual and theoretical foundations to the principles of management with an emphasis on public health and health care settings. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

**401. Behavioral Sciences in Public Health. 2 Hours.** Provides grounding in the behavioral sciences with applications to public health. Examines individual, institutional, and societal responses to the psychosocial factors influencing health and illness. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by the consent of the SPH registrar as space permits.

**402. Social Ethics and Public Health. 3 Hours.** Applications of ideas from philosophy, law, political science and economics to analyze the ethical basis of public health policies and programs.

**403. U.S. Health Care System. 3 Hours.** Overview of the U.S. health care system, including its evolution, utilization patterns, providers—human, institutional, and organizational—financing, regulating, evaluating and reforming.

**405. Leadership in Public Health Practice. 3 Hours.** Same as CHSc 405. Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. Prerequisites: CHSc 400 and consent of the instructor.

**417. Quality Management in Health Services. 2 Hours.** Surveys development of quality management in health services, and theoretical basics and diverse perspectives of quality management and regulation. Presents relevant research and management methodologies. Prerequisites: HPA 400 and CHSc 400.

**429. Introduction to Health Services Research. 2 Hours.** Introduction to health services research using classic studies and current trends which examine access, cost, quality, and organization of health care. Prerequisite: HPA 400.

**430. Introduction to Public Health Policy Analysis. 3 Hours.** Identifies and discusses health status as a function of public policy; policymaking to improve the public's health; current health policy topics and methodology.

**431. Law and Public Health. 3 Hours.** Surveys basic concepts and content in major areas of health law; explains the sources of legal authority; and develops familiarity with legal language and thinking.

**432. Public Health Advocacy. 3 Hours.** Examination of the courts, government agencies, legislatures and public opinion and an analysis of their decision making; planning an advocacy campaign using strategic analysis.

**433. Negotiations for Public Health Professionals. 1 Hour.** Principles of negotiation strategy and tactics; and methods for effective preparation, implementation and analysis of a negotiation. Emphasizes theoretical and practical skills.

**437. Health Care Data. 3 Hours.** Same as BHIS 437. Review of fundamentals constituting a health care information system. How data

is transformed into information and then again transformed into knowledge through integrated computer systems.

**444. Health Care Budgeting and Strategic Planning. 3 Hours.** Budgeting systems in health care; budgeting techniques, flexible budgeting, cost behavior and forecasting, revenue and expense analysis; strategic planning in health care agencies; continuous quality improvement.

**463. Managerial Health Economics. 3 Hours.** Uses managerial economics to study the health care system: demand for medical services; role of health insurance; productivity/cost measurement; labor markets and competition. Prerequisite: HPA 400 or consent of the instructor.

**465. Health Information and Decision Support Systems. 4 Hours.** Introduction to computer assisted management information and decision systems in health organizations: analysis and design of databases; data and information flow; reports; and uses microcomputers. This is an on-line course.

**494. Introductory Special Topics in Health Policy and Administration. 1 to 4 Hours.** Introductory topics in health administration, policy analysis, health care financing, cost-effectiveness evaluation. Topics vary by semesters.

**510. Health Care Information Systems I. 4 Hours.** Same as BHIS 510. Examination, through case studies, of current information technologies and systems currently in place and on the horizon, in health care organizations and in health science libraries. Prerequisite: Consent of the instructor.

**511. Organization Theory Applied to Health Programs. 3 Hours.** Classical and modern organization theories applied to health programs. Includes organization structure and goals, management functions and processes, and managerial controls and evaluation. Prerequisite: HPA 400 or consent of the instructor.

**516. Health Personnel Management. 3 Hours.** Health personnel policies and programs, human resources requirements, recruitment, development, performance appraisal, salary and wage administration, and management/labor relations in the health industry. Prerequisites: HPA 400 and consent of the instructor.

**520. Management of Health Care Communication Systems. 4 Hours.** Same as BHIS 515. Examination and management of data communications in and between health care facilities including examination of issues, standards, technologies, and system configurations. Prerequisite: HPA 510 or consent of the instructor.

**521. Principles and Practices of Planning in Health Care. 3 Hours.** Principles and practices of health planning relevant to organizations and systems; planning at national, regional, community levels; quantitative and qualitative techniques of planning. Prerequisite: HPA 400 or equivalent basic management course.

**522. Health Evaluation Methods. 3 Hours.** Applies social science research methods and theory to the evaluation of health interventions. Uses quasi-experimental designs to evaluate program effectiveness. Students design their own studies. Prerequisite: Bstt 401, and HPA 400 or consent of the instructor.

**523. Evaluating the Cost Effectiveness of Health Programs. 3 Hours.** Development of analytic tools to support management/policy decisions with respect to cost effectiveness of health services; measurement of effectiveness, resource utilization, resource costs and analysis. Prerequisites: HPA 400 and either 463 or 444, and Bstt 401, or consent of the instructor.

**524. Case Management and Managed Care: Theory and Practice. 3 Hours.** Case management as a public health and managed care intervention is applied to such problems as chronic diseases, mental illness, AIDS, and maternal and child health.

**527. Critical Issues in Long Term Care Policy. 3 Hours.** Same as CHSc 527. Long-term care organization, financing, delivery utilization and policy, emphasizing affordability, access and quality in a managed care environment. Prerequisites: CHSc 400 and 425 or consent of the instructor.

**529. Multidisciplinary Research Methods in Clinical Practice I. 2 Hours.** Overview of research methods used in surveys and the study of outcomes in clinical practice. Includes developing a research proposal in a clinical setting. Prerequisites: Graduate standing in the School of Public Health and HPA 400, Epid 400, and Bstt 400; or consent of the instructor.

**530. Public Health and the Political Process. 3 Hours.** Analyzes theoretical basis of political action in public health and the potential justifications for public health regulations and policies. Prerequisite: HPA 402, 430, 431, or 432, or consent of the instructor.

**531. Health Information Systems Analysis and Design. 4 Hours.** Same as BHIS 520. A project course applying systems analysis and design theory to health care systems evaluation, modeling and implementation. Prerequisite: HPA 510 or consent of the instructor.

**540. Applications in Health Informatics. 4 Hours.** Same as BHIS 525. Covers the application of theory through case study analysis, and the use of information systems for quality assurance and management. Prerequisites: HPA 510; and 520 or BHIS 515 or 530; or consent of the instructor.

**543. Advanced Health Economics. 4 Hours.** Same as Econ 555. Topics in the supply and demand for health services; the role of insurance in the medical care industry; public policy issues of cost and quality regulation. Prerequisite: Econ 501 or 520 or consent of the instructor.

**550. Topics in Health Informatics. 4 Hours.** Same as BHIS 530. The study of advanced topics in various areas of health informatics. Prerequisites: HPA 510; and 520 or BHIS 515 or 525; or consent of the instructor.

**551. Marketing Health Programs. 3 Hours.** Concepts of marketing as a management tool; application of marketing to health care: the marketing process, marketing resources, and strategies for accomplishing marketing objectives. Prerequisite: HPA 400 or Mktg 563 or consent of the instructor.

**554. Measuring and Improving Quality in Health Care. 3 Hours.** Provides theoretical and practical examination of the key measurement methods currently in use in the quality management field. Focus is on skills development in quality improvement methods. Prerequisites: Bstt 400, Epid 400, and HPA 417, or consent of the instructor.

**555. National Health Assurance. 2 Hours.** An examination of American society, its effect on the evolution of U.S. health care system, efforts/proposals to reform it, and predictions for the future. Prerequisite: HPA 403 or consent of the instructor.

**556. U.S. Mental Health Policy. 2 Hours.** Public policies which have supported the U.S. mental health service system from 1946 to the present. Theory, development, and evaluation of mental health policy in the US. Prerequisites: HPA 400 and HPA 430; and either Epid 400 or Bstt 400.

**557. Measurement in Health Services Research. 3 Hours.** Presents measurement, reliability and validity theory and assessment using correlation, internal consistency, factor analysis and others. Application in developing analyzing and reporting behavioral and/or organizational measures. Prerequisites: Bstt 400 and 401 or consent of the instructor.

**558. Behavioral Measures in Public Health. 3 Hours.** Examination of methodology, statistical analyses and reporting of behavioral measures used in public health. Criteria given for measurement selection, sources of information and psychometric descriptions. Prerequisites: Bstt 400 and 401 or consent of the instructor.

**559. U.S. Mental Health Services Research. 2 Hours.** The development, conduct, and evaluation of mental health programs in the U.S. from 1946 to the present. Program theory and evaluative research on the spectrum of services. Prerequisites: HPA 400, 430, and either Epid 400 or Bstt 400.

**564. Geographic Information System Application in Public Health. 4 Hours.** Examination of GIS applications in Public Health and the process of designing a GIS-based public health investigation. This is an on-line course. Prerequisites: Bstt 400 and HPA 465; and consent of the instructor.

**571. Measuring Performance and Improving Quality in Public Health. 3 Hours.** Explores the need and the use of tools to measure performance and reengineer systems in public health and in health care. Prerequisite(s): HPA 400 and CHSc 400 or consent of the instructor.

**594. Advanced Special Topics in Health Policy and Administration. 1 to 4 Hours.** Advanced topics in health administration, policy analysis, health care financing, cost-effectiveness evaluation. Topics vary by semester. Prerequisite: Consent of the instructor.

## Histology (Hstl)

**401. General Histology. 5 Hours.** Comprehensive learning experiences in the structure and function of human tissues, organs and organ systems. Microscopic slides are utilized in both lecture and laboratories. Prerequisite: Consent of the instructor.

**451. Oral Histology. 3 Hours.** Animals used in instruction. Microscopic anatomy and physiology of teeth, their supporting tissues, and the associated tissues of the orofacial complex. Prerequisite: Hstl 401 or the equivalent or consent of the instructor.

**501. Advanced Oral Histology. 2 Hours.** Lectures and discussions on special subjects and problems in oral histology. Prerequisites: Hstl 401 or the equivalent and consent of the instructor.

**503. Biology of Mineralized Tissues. 2 Hours.** Lectures and discussion on the formation, structure, and functions of bone, dentin, and enamel. Emphasizes the mechanisms of mineralization. Prerequisites: A basic course in histology and consent of the instructor.

**504. Fine Structure of Oral Soft Tissues. 2 Hours.** Discussions of electron microscopic research methodologies as applied to oral biology with special emphasis on structural-functional relationships in oral soft tissues. Prerequisites: Hstl 401 and 451 or the equivalents and consent of the instructor.

**506. Advanced Oral Histology-Lymphoid Tissues. 2 Hours.** Lectures and discussions on the structure and functions of lymphoid tissues with special interest in orally related diseases. Prerequisites: Hstl 401, a course in microbiology and consent of the instructor.

**507. Physiological Basis of Pathology. 2 Hours.** Same as Path 507. Subject matter allied to general pathology but going deeper into physical chemistry and physiological principles, as set forth in N.R. Joseph's Comparative Physical Biology. Prerequisite: Hstl 401 or Path 421 and 422.

**514. Oral Biology Seminar. 1 Hour.** Same as OMDS 527. S/U grade only. Invited speakers present the progress of current research work in their field of interest related to oral tissues. Prerequisite: Consent of the instructor.

**515. Electron Microscopy in Dentistry. 1 Hour.** Same as OMDS 529. Principles, theory, and practice of transmission and scanning electron microscopy, and energy dispersive X-ray microanalysis. Processing, sectioning, staining and examination of tissues. Prerequisite: Consent of the instructor.

**598. Research in Histology. 0 to 16 Hours.** S/U grade only. Thesis research in histology.

## History (Hist)

**400. Topics in Ancient History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**401. Topics in Greek History. 4 Hours.** Same as CI 401. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

**402. Topics in Roman History. 4 Hours.** Same as CI 402. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

**404. Roman Law and the Civil Law Tradition. 4 Hours.** Same as CI 404 and CrJ 404. Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. Prerequisite: CrJ 200 or Hist 203 or consent of the instructor.

**406. Topics in Medieval History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term.

**409. Topics in Early Modern European History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**410. Topics in Modern European History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**418. Topics in German History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

**421. Topics in British and Irish History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 6 hours of history or consent of the instructor.

**424. Topics in French History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: One 200-level course in French or European history or consent of the instructor.

**429. Topics in Italian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**433. Topics in Eastern European History. 4 Hours.** Same as Slav 433. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

**435. Topics in Russian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

**441. Topics in African History. 4 Hours.** Same as AAST 441. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of African history, African-American studies, or consent of the instructor.

**445. History of Islam in the African World. 4 Hours.** Same as AAST 445. A comprehensive study of the history of Islam and its role among the people of African descent in sub-Saharan Africa and the United States. Prerequisite: Consent of the instructor.

**451. Topics in Colonial American History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of U.S. history or consent of the instructor.

**452. Topics in Revolutionary and Early National United States History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**453. Topics in Nineteenth-Century United States History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**454. Topics in Twentieth-Century United States History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of U.S. history or consent of the instructor.

**455. Topics in Southern History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

**461. Topics in Latin American History. 4 Hours.** Same as LALS 461. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history, Latin American and Latino Studies, or consent of the instructor.

**471. Topics in East Asian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of East Asian history or consent of the instructor.

**472. Issues and Events in Twentieth-Century China. 4 Hours.** Same as AsSt 472. Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history.

**473. Topics in East Asian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Same as AsSt 473. Previously listed as: Hist 471. Specific topics are announced each term. Prerequisite: 3 hours of East Asian history or consent of the instructor.

**474. History and Archives. 4 Hours.** Same as GWS 474. Introduction to archival preservation and management. Under faculty supervision, students will create a records management plan for an organization to preserve documents of historical importance. Includes internship at an external agency. Prerequisite: 3 hours of history or consent of the instructor.

**475. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a



two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**476. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Hist 475, and approval of the department.

**477. Topics in Middle Eastern History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

**478. Women in Chinese History. 4 Hours.** Same as AsSt 478 and GWS 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution and the historiography of the field.

**479. Culture and Colonialism in South Asia. 4 Hours.** Same as Anth 479 and AsSt 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

**480. Topics in Economic History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**481. Topics in Social History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**482. Topics in Migration History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

**483. Topics in the History of Public Policy. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

**484. Topics in the History of Women. 4 Hours.** Same as GWS 484. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or gender and women's studies or consent of the instructor.

**485. Topics in African-American History. 4 Hours.** Same as AASSt 481. May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. African-American history for students with significant background in the field. Topics vary. Prerequisite: Hist 104 or 247 or 248 or consent of the instructor.

**486. Topics in the History of Science. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours in history.

**487. Topics in the History of Sexuality. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours in history or consent of the instructor.

**488. Topics in Urban History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

**489. Topics in Military History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**490. Topics in Diplomatic History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Prerequisite: 3 hours of history.

**491. Topics in Constitutional History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**492. Topics in Intellectual History. 4 Hours.** May be repeated for credit. Students may register for more than one section per

term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**493. Topics in Historiography. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**494. Topics in Political History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

**495. Topics in Religious History. 4 Hours.** Same as RelS 495. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**496. Topics in Race, Ethnic, and Minority History. 4 Hours.** Same as AASSt 496. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**497. Topics in Cultural History. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**498. Topics in Quantitative Methods. 4 Hours.** May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**500. Colloquium on the Teaching of History. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**501. Introduction to Graduate Study in History. 4 Hours.** Required for graduate students in the MA and PhD in History programs. Introduction to history as a discipline and profession. Approach is comparative and by topic. Prerequisite: Graduate standing in history.

**502. Seminar on Ancient History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**507. Colloquium on Medieval History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Topics on themes of medieval history. Specific topics are announced each term.

**508. Seminar on Medieval History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**511. Colloquium on European History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**512. Seminar on European History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**521. Colloquium on British History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**522. Seminar on British History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**531. Colloquium on Russian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**532. Seminar on Russian History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**541. Colloquium on African History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Readings on select topics in African history.

**542. Seminar on African History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**551. Colloquium on American History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**552. Seminar on American History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.



**561. Colloquium on Latin American History. 4 Hours.** Same as LALS 561. May be repeated for credit. Students may register for more than one section per term. Topics on themes in Latin American history. Specific topics are announced each term.

**562. Seminar on Latin American History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

**580. Chicago Consortium in Ancient History. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. Holding course for graduate students taking approved course work at other universities through the Chicago Consortium in Ancient History. Prerequisite: Approval of the director of graduate studies.

**591. Preliminary Examination and Dissertation Prospectus Preparation. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. S/U grade only. Under the supervision of a faculty mentor, the student will prepare for the preliminary examination and prepare the dissertation prospectus required by the department. Prerequisite: Approval of the department or completion of all didactic course work in the PhD in history program.

**592. Colloquium on Approaches to History. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Prerequisite: Preliminary examination.

## Human Nutrition (HN)

**410. Nutritional Biochemistry. 3 Hours.** Biochemical basis for nutritional principles and concepts. Prerequisites: HN 310; or both HN 196 and CHSC 414; or the equivalent courses; or consent of the instructor.

**413. Principles of Delivering Public Health Nutrition Services. 3 Hours.** Same as CHSC 413. Assessment, planning, and evaluation of community nutrition programs using a systems approach. Prerequisite: CHSC 411 or consent of the instructor.

**420. Clinical Nutrition II. 3 Hours.** Principles of nutrition, biochemistry, physiology, pathology, education, and psychology related to management of selected diseases (gastrointestinal diseases, hypermetabolic states and cancer). Prerequisites: HN 310 and 320, or consent of the instructor.

**421. Clinical Practice II. 4 Hours.** Practical experiences in the nutritional management and support of selected disease processes such as cancer, gastrointestinal and hypermetabolic states. Prerequisites: HN 321, and concurrent registration in HN 420 or consent of the instructor.

**422. Clinical Nutrition III. 3 Hours.** Principles of nutrition, biochemistry, physiology, and pathology related to the management of critically ill patients and selected disease processes such as pediatrics and renal disorders. Prerequisites: HN 309 and HN 420 or consent of the instructor.

**423. Clinical Practice III. 5 Hours.** Clinical practicum which focuses on the nutritional management of critically ill patients or specialized patient populations (renal and pediatric patients). Prerequisites: HN 421 and credit or concurrent registration in HN 422 or consent of the instructor.

**430. Management in Human Nutrition. 2 Hours.** Tools of management and management systems. Prerequisite: HN 332 or consent of the instructor.

**450. Professional Practice. 6 Hours.** Extended practicum that integrates acquired skills, knowledge, and attitudes in dietetics. Special emphasis on current dietetic issues facing the health care professional. Prerequisite: HN 423 or consent of the instructor.

**461. Nutrition Laboratory. 2 Hours.** Chemical analysis of food, blood, and urine for certain predetermined constituents; nutrient balance study. Prerequisite: Bche 307 or the equivalent or consent of the instructor.

**480. Field Study. 2 Hours.** Provides practical experience to develop/strengthen the student's knowledge and skills in an area of nutrition practice. Prerequisite: HN 410 or consent of the instructor.

**510. Nutrition-Physiological Aspects. 3 Hours.** A thorough discussion of the absorption, transport, and metabolism of macronutrients, plus factors affecting these processes. Treats in an integrated fashion how various organs participate. Prerequisites: HN 410 and PhyB 341 or the equivalent, or consent of the instructor.

**514. Vitamins in Human Nutrition. 2 Hours.** Clinical aspects of vitamin requirements and metabolism in human nutrition; bioavailability, nutrient interactions and interrelationships of vitamins with various disease states. Prerequisite: HN 410 or consent of the instructor.

**515. Minerals in Human Nutrition. 2 Hours.** Clinical aspects of essential mineral requirements and metabolism in human nutrition; bioavailability, nutrient interactions and trace and ultra-trace elements. Prerequisite: HN 410 or consent of the instructor.

**520. Maternal Nutrition and Early Development. 2 Hours.** Physiological and biochemical basis of human requirements for nutrients during pregnancy, factors affecting nutritional management of normal pregnancy and lactation, and special conditions during pregnancy. Prerequisite: HN 410 or consent of the instructor.

**522. Advances in Pediatric Nutrition. 2 Hours.** An overview of normal pediatric nutrition and in-depth nutrition for various problems and diseases of children. Prerequisite: HN 410 or consent of the instructor.

**525. Nutrition and Aging. 2 Hours.** Factors affecting the human requirements for nutrients during aging, emphasizing the physiological and biochemical changes related to the nutritional needs of the elderly. Prerequisite: HN 410 or consent of the instructor.

**530. Research Methods in Human Nutrition. 3 Hours.** Research designs in human nutrition; conceptual issues in clinical and population studies; problems in collection and analysis of dietary, behavioral, and self-reported data. Prerequisite: AHS 510 or consent of the instructor.

**531. Instrumentation Techniques in Human Nutrition. 2 Hours.** Modern analytical techniques used in human nutrition studies including atomic absorption, electrophoresis, gas chromatography, HPLC, and radioisotopes. Prerequisite: HN 300 or consent of the instructor.

**532. Evaluation of Nutritional Status. 3 Hours.** Community and clinical considerations in nutrition status surveillance and monitoring systems; characterization in the collection, standards and reference population development. Prerequisite: HN 410 or consent of the instructor.

**535. Nutrition and Human Performance. 2 Hours.** Same as Kine 535. Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. Prerequisites: HN 410 and either PhyB 341 or Kine 352, or consent of the instructor.

**541. Research on Clinical Nutrition Problems. 2 Hours.** Development and conduct of research on clinical nutrition problems, patient outcomes, or nutrition or food service delivery systems within a hospital or ambulatory care setting. Prerequisite: Consent of the instructor.

**570. Advances in Clinical Nutrition I. 2 Hours.** Selected topics in clinical nutrition, emphasizing current theory, research, and practice in such areas as cardiovascular disease, obesity, diabetes, and iatrogenic malnutrition. Prerequisite: HN 422 or consent of the instructor.

**571. Advances in Clinical Nutrition II. 2 Hours.** Selected topics in clinical nutrition, emphasizing current theory, research, and practice in gastrointestinal and renal diseases and nutritional management of some disorders which may have nutritional implications. Prerequisite: HN 422 or consent of the instructor.

**580. Advanced Field Practicum. 2 Hours.** Advanced practice experience in a specialized area of human nutrition and dietetics. The practicum may be carried out in a clinical setting, business, industry, or government agency. Prerequisite: HN 410 or consent of the instructor.

**581. Dietetics/Nutrition Instructional Practicum. 2 Hours.** Teaching practicum in clinical dietetics and/or nutrition. Prerequisites: HN 410 and 570 and 201 or the equivalent, or consent of the instructor.

**594. Special Topics in Human Nutrition. 1 to 4 Hours.** May be repeated for credit. Advanced course dealing with selected topics. Topics vary from year to year and may include drug/nutrient

interaction, protein metabolism, nutrition and behavior, nutrition and exercise. Prerequisite: HN 410 or consent of the instructor.

**595. Seminar in Human Nutrition. 1 Hour.** May be repeated for credit with the approval of the department. S/U grade only. Topics of current interest in human nutrition. Includes discussions of current journal articles and important new developments in the specific disciplines. Prerequisite: HN 410 or consent of the instructor.

**596. Independent Study in Human Nutrition. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Study in selected areas of human nutrition is carried out under the direction of a faculty member. Modes of investigation are determined by the nature of the problem selected. Prerequisites: Admission to the HN graduate program and consent of the instructor.

**597. Project Research. 1 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to pursue a project other than thesis research. Prerequisite: Consent of the instructor.

**598. Research in Human Nutrition. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent research in one area of human nutrition. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent dissertation research by the student, under the guidance of the adviser. Prerequisite: Consent of the faculty adviser.

## Industrial Engineering (IE)

**412. Dynamic Systems Analysis I. 4 Hours.** Same as ME 412. Classical control theory, concept of feedback, laplace transform, transfer functions, control system characteristics, root locus, frequency response, compensator design. Prerequisite: ME 308.

**446. Quality Control and Reliability. 4 Hours.** Principles of statistical quality control including control by variable and by attribute, construction and use of control charts for variables, fraction defectives and number of defects and use of standard plans, reliability and life cycle testing. Prerequisite: IE 342.

**450. Stochastic Processes. 4 Hours.** Description and analysis of probabilistic systems; recurrent event models, Markov processes, and queueing systems; simulation of stochastic processes; applications to engineering systems. Prerequisite: IE 342.

**461. Safety Engineering. 4 Hours.** Accident losses; standards and codes; hazards control; accident investigations; mechanical injuries; heat, pressure, and electrical hazards; fires and explosions; toxic materials and radiation; vibration and noise; course project. Prerequisite: IE 342.

**463. Plant Layout and Materials Handling. 4 Hours.** Facilities design functions, computer-aided plant layout, facility location, warehouse layout Minimax location, deterministic and probabilistic conveyor models. Prerequisite: IE 471.

**464. Virtual Automation. 4 Hours.** Same as ME 464. Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing; industrial robots and automated factory models within virtual environments. Prerequisites: IE 201 and CS 107.

**465. Manufacturing Information Systems. 4 Hours.** Design and implementation of supervisory control and data acquisition systems; manufacturing systems controller and communication networks. Prerequisites: Consent of the instructor; and familiarity with computer programming.

**466. Production Planning and Inventory Control. 4 Hours.** Principles of demand forecasting, production planning, master scheduling, critical path scheduling, job sequencing, design and control of deterministic and stochastic inventory systems, material requirement planning. Prerequisites: IE 345 and 471.

**467. Industrial Systems Simulation. 4 Hours.** The solution of industrial problems by means of computer simulation. Simulation strategies. Simulation perspectives. In-depth study of some specific simulation programming languages, with projects.

**468. Virtual Manufacturing. 4 Hours.** Same as ME 468. Virtual reality applications in manufacturing systems design, manufacturing applications of networked virtual reality, virtual reality modeling of occupational safety engineering. Prerequisite: Consent of the instructor.

**471. Operations Research I. 4 Hours.** Introduction to operations research, formulation of linear programming problems, simplex methods, duality theory, sensitivity analysis, and integer linear programming. Prerequisite: IE 342.

**472. Operations Research II. 4 Hours.** Nonlinear programming problems, unconstrained optimization search techniques. Kuhn-Tucker theorems, quadratic programming, separable programming, geometric programming and dynamic programming. Prerequisite: IE 471.

**494. Special Topics in Industrial Engineering. 4 Hours.** May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

**520. Maintenance Engineering. 4 Hours.** Decision making and failure statistics, reliability engineering and maintenance, queueing theory in maintenance, spares inventory control, maintenance network planning, condition-based maintenance. Case studies. Prerequisites: IE 342 and 446.

**542. Advanced Computational Methods for Product and Process Design. 4 Hours.** Same as ME 542. Deterministic and statistical methods for modeling and optimizing engineering systems, in the broad context of product design, manufacturing process development, and designing for life cycle issues. Prerequisite: Programming language experience.

**545. Statistical Modeling of Time Series. 4 Hours.** An engineering approach to time series analysis and applications. Identification, forecasting, control, characterization, design, etc. of industrial and physical systems. Prerequisite: IE 345.

**546. Reliability and Maintainability. 4 Hours.** Stochastic models of failure for components and systems, reliability measures, reliability testing, estimation of failure distributions, design reliability concepts, fundamentals of maintainability and availability. Prerequisite: IE 446.

**550. Applied Stochastic Processes. 4 Hours.** The stochastic nature of queues, inventories and engineering reliability. Comprehensive analysis of queueing systems, Arkov chains, inventory models and reliability problems. Prerequisite: IE 450.

**552. Applied Stochastic Processes II. 4 Hours.** Same as IDS 547. Stationary point processes; Markov renewal theory; semi-Markov processes; regenerative processes; computational methods and applications to queues, inventories, dams, and reliability. Prerequisite: IE 550.

**561. Advanced Safety Engineering. 4 Hours.** System analysis and synthesis, hazard analysis, cost effectiveness, logical analysis, probabilistic reliability considerations, fault tree analysis, statistical analysis, information system design, budget allocating. Prerequisite: IE 461.

**562. Supervisory Control of Discrete Event Systems. 4 Hours.** Discrete event systems; languages and automata, supervisory control, timed models, supervisory control applications. Extensive computer use required.

**564. Advanced Industrial Automation. 4 Hours.** Advanced topics in industrial automation, including automatic process planning, computer control of manufacturing systems, CAD/CAM and robotics, CNC/DNC, and FMS. Prerequisite: IE 464 and 380.

**565. Expert Systems in Manufacturing. 4 Hours.** Industrial uses of expert systems; applicability to industrial processes; availability of commercial expert systems; design and implementation of expert systems; knowledge engineering, research uses of expert systems.

**566. Advanced Quality Control. 4 Hours.** Advanced analysis of various acceptance sampling plans and process control techniques, including Bayesian and non-Bayesian models, risk and cost based approaches. Prerequisites: IE 342 and 446.

**567. Statistical Analysis of Simulation Outputs. 4 Hours.** Principles and techniques of analyzing the outputs of stochastic simulated models, including determination of run lengths, reduction of variance, time-series methods, experimental design. Prerequisite: IE 467.

**568. Advanced Production and Inventory Control. 4 Hours.** Design and analysis of deterministic and stochastic production and inventory systems, computerized processing of production and inventory, material requirement planning (MRP), and manufacturing resource planning. Prerequisite: IE 466.

**569. Advanced Virtual Manufacturing. 4 Hours.** Same as ME 569. Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. Prerequisite: Consent of the instructor.

**571. Statistical Quality Control and Assurance. 4 Hours.** Same as IDS 571. The importance of quality in products and services, quality surveillance, Deming's management method, Ishikawa's seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

**575. Advanced Optimization Techniques I. 4 Hours.** Same as IDS 545. Theoretical foundations of linear and integer programming; convex sets; linear inequalities; linear programming theory and algorithms; integer programming; applications in production scheduling and inventory control. Prerequisites: Math 413 and 310 and IDS 435 or IE 471 or Math 461.

**576. Advanced Optimization Techniques II. 4 Hours.** Same as IDS 546. Nonlinear programming; optimality conditions; convex programming; Rockefeller and Lagrange duality; algorithms and numerical methods; applications to engineering design and economics. Prerequisite: IE 575.

**594. Current Topics in Industrial Engineering. 4 Hours.** May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

**595. Seminar on Industrial Engineering Research. 1 Hour.** S/U grade only. Advances in industrial engineering research will be discussed in a seminar setting. Students will be expected to make presentations in various areas, as well as invited faculty speakers. Prerequisite: Graduate standing in industrial engineering.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Individual study under close supervision of a faculty member. Prerequisite: Consent of the instructor.

**598. MS Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research in specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research on specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

## Information and Decision Sciences (IDS)

**400. Advanced Business Programming Using Visual Tools. 4 Hours.** Visual extended business language capabilities, including creating and using controls, menus and dialogs, objects and instances, mouse events, graphics, file-system controls. Prerequisite: IDS 201 or a programming course in mathematics or computer science, or consent of the instructor.

**401. Business Computing II: Data Structures and Operating Systems. 4 Hours.** Data structures; file structures. Searching and sorting; algorithm design and analysis. Operating systems; process management; memory management; processor management; file systems; case studies; programming projects. Prerequisite: IDS 201.

**405. Business Systems and Analysis Design. 4 Hours.** Theory of analysis, design and development of information systems; information management and database management systems; data management and analysis; case studies in systems implementation and evaluation. Prerequisites: IDS 100 and 201 and credit or concurrent registration in IDS 410 or the equivalent courses.

**406. Business Systems Design Project. 4 Hours.** Selected issues in the design, development, and evaluation of computer-based business information systems: forms design, general software systems, users interfaces, research systems, quality control, and documentation standards. Includes a project at an outside company or University office. Prerequisites: IDS 201 and 405 or the equivalent courses; or consent of the instructor. Business administration students must have declared a major.

**410. Business Database Design. 4 Hours.** Computer software techniques used in business with emphasis on information management and database management systems. Data management and analysis. Major types of database management systems, query languages. Prerequisite: IDS 100 and 201 or the equivalent courses.

**412. Distributed Business Systems. 4 Hours.**

Organizational aspects and underlying concepts of distributed business systems, decentralization versus centralization issues, costs of distributed computing, and performance evaluation measures. Prerequisite: IDS 400 or 401 and credit or concurrent registration in IDS 410; or consent of the instructor.

**420. Business Systems Simulation. 4 Hours.** Simulation analysis of the operations of a system from the perspective of the entire company; optimal decisions are generated for the controllers of the systems. Prerequisites: IDS 201 and IDS 355 and Math 205 or the equivalent courses.

**422. Decision Support and Expert Systems. 4 Hours.** Judgement, knowledge, and experience-based systems; components of decision support systems (DSS) and expert-systems (ES); languages and tools for development of DSS/ES: active decision and problem-solving support in semi-structured or unstructured situations; hands-on experience. Prerequisite: IDS 355 and 410 or consent of the instructor.

**426. Computer Performance Evaluation and Modeling. 4 Hours.** Probabilistic, simulation, and statistical techniques for modeling computer systems with a view to evaluating their performance. Models of multiprogramming systems, multi-access systems, input/output systems, scheduling algorithms, and paging systems are described. Prerequisites: IDS 371 and either IDS 405 or 410, and a business core computer language course, or the equivalents, or consent of the instructor. Credit in IDS 420, while not required, is recommended. Business administration students must have declared a major.

**435. Operations Research I. 4 Hours.** Linear programming, simplex algorithm, duality, sensitivity analysis, convex programming, parametric programming. Transportation and assignment problems, goal programming. Prerequisites: IDS 355, and Math 205 or the equivalent. Business administration students must have declared a major.

**436. Operations Research II. 4 Hours.** Nonlinear operations research. Nonlinear programming: optimality conditions, convexity, heuristic methods, applications. Inventory control theory: classical models, stochastic complications. Integer programming: enumerative techniques, cutting plane techniques. Prerequisite: IDS 435 or the equivalent, or consent of the instructor. Business administration students must have declared a major.

**437. Operations Research III. 4 Hours.** Markov chains, queueing theory, stochastic inventory control theory, dynamic programming. Prerequisites: IDS 355 and Math 205 or the equivalent. Business administration students must have declared a major.

**446. Decision Analysis. 4 Hours.** Prior and posterior distributions, conjugate priors, value of information, applications to decision making in business. Prerequisite: IDS 371.

**450. Operations Management II. 4 Hours.** Extensive computer use required. Application of management science to the operation and control of production, distribution, and service systems. Emphasis on inventory management, production planning, capacity expansion, and demand forecasting. Prerequisite: IDS 355 or the equivalent. Business administration students must have declared a major.

**454. Supply Chain Management. 4 Hours.** Supply Chain Management is studied as an information-intensive, integrated system for managing material flows, logistics and inter-organizational partnership to deliver products and services. Prerequisite: IDS 450.

**460. Survey Sampling: Theory and Methods. 4 Hours.** Planning and analyzing surveys. Topics include simple random sampling, stratified sampling, systematic sampling, ratio estimation and cluster sampling. Case studies with applications to real situations are discussed. Prerequisite: IDS 371.

**462. Statistical Software for Business Applications. 4 Hours.** Statistical software in business applications and data mining. SAS and other packages such as SPSS, MATLAB, Maple, Splus, B34S, SCA. Prerequisite: IDS 371 or consent of the instructor.

**465. Analysis of Variance and Experimental Design. 4 Hours.** General theory of design and analysis of experiments. Least squares estimation, multiple regression, analysis of variance, randomization, randomized blocks, Latin squares, factorial designs, replication, incomplete blocks. Prerequisites: IDS 371; and Math 205 or 310 or 320.

**470. Multivariate Analysis I. 4 Hours.** Introduction to the structure and analysis of multivariate data. Emphasis on the multivariate normal model. Regression, tests concerning multivariate means,



classification, discriminant analysis, principal components.

Prerequisites: IDS 371; and Math 205 or 310 or 320.

**472. Statistical Methods for Mgmt Information Systems & Data Mining. 4 Hours.** Updating statistical databases. Cluster analysis, logistic regression, classification and regression trees, neural networks, path analysis. Applications to marketing, quality assurance, operations management, human resources management. Prerequisite: IDS 371 or the equivalent.

**474. Quality and Productivity Improvement Using Statistical Methods. 4 Hours.** Directed experimentation for quality and productivity improvement, quality surveillance, design and analysis of two-level factorial experiments and multilevel experiments, data transformation. Prerequisite: IDS 371 or consent of the instructor.

**476. Business Forecasting Using Time Series Methods. 4 Hours.** Same as Econ 450. Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multivariable transfer function models is also included. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

**478. Regression Analysis. 4 Hours.** Data collection and exploration; model building; variable least squares; residual analysis; variable selection; multicollinearity; ridge regression; nonlinear regression; nonparametric regression. Prerequisite: IDS 371.

**480. Cluster Analysis with Applications in Business. 4 Hours.** Clustering individuals. Clustering variables. Block clustering. Empirical investigations. Applications of cluster analysis on market research, stock market analysis, or other fields. Prerequisite: IDS 371 or consent of the instructor.

**494. Topics in Information and Decision Sciences. 3 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Topics vary, selected readings, case analysis. Prerequisite: Consent of the instructor.

**495. Competitive Strategy. 4 Hours.** Multidisciplinary analysis of organizational strategy and policy using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

**499. Independent Study in Information and Decision Sciences. 1 to 3 Hours.** May be repeated for a maximum of 9 hours of credit. Intensive study of selected topics determined in consultation with the instructor and department head. Prerequisites: Major in information and decision sciences and consent of the instructor.

**500. Information Technology for Management. 4 Hours.** Use of information technology in business; planning, management, and strategic use of information technology including the role of enterprise-wide systems, the Internet, and electronic commerce. Prerequisite: Admission to the MBA Program.

**504. Introduction to Electronic Commerce. 4 Hours.** Addresses issues on electronic commerce for businesses and consumers, considering topics such as competition, distribution, infrastructure on the Internet, shopping, and product characteristics.

**505. Business Information Systems Analysis and Design. 4 Hours.** A student who has taken IDS 405 must see an adviser to determine whether another graduate course from IDS, Math, or Computer Science must be substituted for IDS 505. Analysis, design and development of information systems. Management concerns in systems design, development, and evaluation. Includes a project at an outside company or University office. Prerequisite: IDS 500; or consent of the instructor.

**507. Advanced Systems Analysis and Design Project. 4 Hours.** Principles and concepts of analysis, design and development of information systems including project management. Includes a project at an outside company or University office. Prerequisite: Consent of the instructor, and completion of three MS in MIS courses.

**508. E-Commerce Project. 4 Hours.** Electronic commerce project initiated by local small and medium enterprises, teaming students with technical or entrepreneurial skills/interests, supervised by faculty on board of directors. Prerequisites: IDS 504 or Mgmt/Mktg 558 and consent of the instructor.

**509. Advanced Systems Analysis and Design. 4 Hours.** Principles and concepts of analysis, design and development of information systems using structured and object oriented methodologies, tools and techniques. Prerequisite: IDS 401.

**510. Administrative Computer Technology. 4 Hours.** A student who has taken IDS 410 must see an adviser to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 510. Software technology as used in business, emphasizing information management and database systems. Data management, data analysis, major types of database systems, query languages, security, and control. Applications to business systems. Prerequisite: IDS 500.

**511. Query Processing in Database Systems. 4 Hours.** Same as CS 580. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: CS 480.

**514. Management of Information Systems. 4 Hours.** Administration, control, and management of computer-based information systems, projects, and relationships with the organization. Scheduling of operations; management of computer professionals; planning and control of the systems activity. Prerequisite: IDS 505 or IDS 510.

**516. Planning Models and Decision Support Systems. 4 Hours.** Analysis, design and development of decision support systems. Managerial and behavioral concerns in decision support system design, development and evaluation. Prerequisite: IDS 505 or IDS 510.

**518. Electronic Marketing. 4 Hours.** Same as Mktg 518. Overview of the electronic marketing value chain. Internet and web technologies, system design, payment systems, business requirements for e-marketing, design and ethical issues. Prerequisite: Mktg 500 or MBA 506 or consent of the instructor.

**519. Topics in Information Systems. 4 Hours.** May be repeated for credit. Selected topics in information systems, information management and information technology. Content varies. Topics will be announced. Prerequisites: IDS 505 or IDS 510; and consent of the instructor.

**520. Distributed Processing and Telecommunication Systems. 4 Hours.** Topics include components of telecommunications and distributed information systems, data communication devices, computer networks, configuration management and distributed databases. Prerequisite: IDS 505 or IDS 510.

**521. Advanced Database Management. 4 Hours.** Data analysis for database design; logical data modeling, transaction modeling; implementation models; physical database design; database tuning and performance evaluation; database decomposition; distributed database; database security. Prerequisite: IDS 505 or IDS 510.

**522. Expert Systems for Business Applications. 4 Hours.** Components of expert systems; languages and tools for development of expert systems; representation of business knowledge such as marketing, accounting, and finance. Prerequisite: IDS 505 or IDS 510.

**523. Audit and Control of Information Systems. 4 Hours.** Modeling and analysis of information systems application in organizations; measurement of effectiveness; strategies for implementation and updating; interface with other management control systems. Prerequisite: IDS 505 or IDS 510.

**526. Computer Performance Evaluation and Modeling. 4 Hours.** A student who has taken IDS 426 must see an adviser to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 526. Probabilistic, simulation and statistical techniques for modeling computer systems with a view to evaluating their performance. Models of multi-programming systems, multi-access systems input/output systems, priority queues, and paging systems. Prerequisites: IDS 532; and IDS 505 or IDS 510.

**527. Seminar on System Development and Management. 4 Hours.** May be repeated for credit. Current topics in system development and management. Topics vary from term to term depending on the interests of the instructor and students. Prerequisites: IDS 505 and consent of the instructor.

**528. Seminar on Database Design. 4 Hours.** May be repeated for credit. Selected topics in logical and physical database modeling and design. Topics vary. Prerequisite: Consent of the instructor.

**529. Seminar on Management Information Systems. 4 Hours.** May be repeated for credit. Special research topics in management information systems. Topics vary from term to term depending on the interests of the instructor and students. Prerequisite: IDS 505 or IDS 510.

**532. Decision Models and Information Systems II. 4 Hours.** Credit is not given for IDS 532 if the student has credit in



MBA 507 and 509. MBA core course that integrates decision sciences and information systems. Emphasizes forecasting and decision models. Prerequisite: Admission to the MBA Program.

**545. Advanced Optimization Techniques I. 4 Hours.**

Same as IE 575. Theoretical foundations of linear and integer programming; convex sets; linear inequalities; linear programming theory and algorithms; integer programming; applications in production scheduling and inventory control. Prerequisites: Math 413 and 310 and IDS 435 or IE 471 or Math 461.

**546. Advanced Optimization Techniques II. 4 Hours.**

Same as IE 576. Nonlinear programming; optimality conditions; convex programming; Rockefeller and Lagrange duality; algorithms and numerical methods; applications to engineering design and economics. Prerequisite: IDS 545.

**547. Applied Stochastic Processes II. 4 Hours.** Same as IE 552. Stationary point processes; Markov renewal theory; semi-Markov processes; regenerative processes; computational methods and applications to queues, inventories, dams, and reliability. Prerequisite: IE 550.

**551. Operations Management in the Service Sector. 4 Hours.** Comparison of service and manufacturing operations; analysis of effects of capacity, quality, and service firm life cycle on operations. Prerequisite: Credit or concurrent registration in IDS 532, or consent of the instructor.

**552. Inventory Management. 4 Hours.** Structure of inventory decision and operating procedures; single event and continuous systems for both single and multiple products; order quantity and periodic review models; demand forecasting. Prerequisite: Credit or concurrent registration in IDS 532, or consent of the instructor.

**553. Production Management and Control. 4 Hours.**

Project scheduling and resource allocation; capacity planning; aggregate planning, scheduling and dispatching; plant layout; material requirement planning; production flow and line balancing. Prerequisite: IDS 532.

**570. Statistics for Management. 4 Hours.** Survey of statistical methods with applications for business and management. Prerequisite: Admission to any business graduate program or consent of the instructor.

**571. Statistical Quality Control and Assurance. 4 Hours.**

Same as IE 571. The importance of quality in products and services, quality surveillance, Deming's management method, Ishikawa's seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

**577. Research Methodology I. 4 Hours.** Use of statistics and computers in research. Data collection and organization, survey sampling, questionnaire design, experimental design. Prerequisites: IDS 532 or the equivalent and admission to the PhD program in Business Administration.

**578. Research Methodology II. 4 Hours.** Data analysis, including estimation, hypotheses testing, nonparametric methods, analysis of variance, regression analysis, economic forecasting, and time series. Prerequisite: IDS 577 or the equivalent.

**582. Business Research and Forecasting I. 4 Hours.**

Same as Econ 537. The role of research in business; forecasting methods and techniques, including models and their applications. Prerequisites: Econ 534 and at least one statistics course with regression analysis at the 300-level or above.

**583. Business Research and Forecasting II. 4 Hours.**

Same as Econ 538. The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. Prerequisite: IDS 476 or 582.

**594. Special Topics in Information and Decision Sciences. 4 Hours.**

Intensive study of a selected topic. Content varies. Topics are announced. Prerequisite: Consent of the instructor.

**596. Independent Study in Information and Decision Sciences. 1 to 4 Hours.** Students may register for more than one section per term. Independent study under the direction of a faculty member. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on topic of the doctoral dissertation. Prerequisite: Consent of the instructor.

## Interdisciplinary Public Health (IPHS)

**420. Resource Databases in Public Health. 1 Hour.** S/U grade only. Use of print and electronic data bases of the U.S. Public Health Service, including CDC and NCHS and health care bibliographic databases.

**440. Public Health Practices. 3 Hours.** Explores in detail one major Illinois public health problem, utilizing community public health leaders as instructors.

**464. Introduction to Injury Control. 2 Hours.** Public health aspects of injury control. Pre-event: human-environment interactions; event: biomechanics, protective techniques; post-event: emergency medical systems, injury assessment; societal costs; legal and policy aspects. Prerequisite: Epid 400 or Bstt 400 or another graduate-level course in statistics or consent of the instructor.

**494. Introductory Special Topics—Interdepartmental. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Introductory special topics in public health. Course content will vary from semester to semester.

**530. Practicum in Mental Health Diagnosis. 4 to 8 Hours.** Review of mental health diagnostic process. Students in psychosocial epidemiology participate with medical students in a psychiatry clerkship. Prerequisites: CHSc 460 and consent of the instructor.

**540. Advanced Public Health Practices. 3 Hours.**

Develop a proposal for the solution or alleviation of the public health problem studied in IPHS 440 by a team of health professionals, faculty, and students. Prerequisite: IPHS 440.

**594. Advanced Special Topics—Interdepartmental. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced special topics in public health. Course content will vary from semester to semester.

**595. Seminar in Interdisciplinary Public Health Sciences. 1 to 3 Hours.**

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Analysis of current research in public health. Course content will vary from semester to semester. Prerequisite: Consent of the instructor.

**596. Independent Study in Public Health. 1 to 4 Hours.**

May be repeated for credit. Students may register for more than one section per term. Selected aspects of specific public health problems; independent study under close supervision of faculty. Prerequisite: Consent of instructor who has supervised at least one course in the area of the independent study.

**598. Research in Public Health Sciences—MS 0 to 16 Hours.**

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the thesis requirements for the Master of Science degree. Prerequisite: Consent of the instructor.

**599. Research in Public Health Sciences—PhD 0 to 16 Hours.**

May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the dissertation for the Doctor of Philosophy degree. Prerequisite: Consent of the instructor.

## Italian (Ital)

**402. Italian Syntax. 4 Hours.** Structure of the grammatical system of Italian. Analysis of the most important syntactic phenomena with emphasis on the meanings and functions of verb forms. Prerequisite: Ital 305 or consent of the instructor.

**410. Italian Medieval Literature. 4 Hours.** Representative literary movements and figures from the origins through the fourteenth century. Emphasis on Dolce Stil Novo, Dante's minor works, Petrarch, and Boccaccio. Prerequisite: Ital 310.

**411. Literary Forms in Early Renaissance. 4 Hours.** The development of epic poetry (Pulci, Boiardo, Ariosto) within the literary, political, and social context (Machiavelli and Castiglione). Prerequisite: Ital 310 or consent of the instructor.

**412. Literary Forms in Late Renaissance and Baroque. 4 Hours.** Representative literary works of the genres of the late sixteenth and seventeenth centuries: epic poem of Tasso and poetry of Marino. The birth of the *Commedia dell'Arte* form. Prerequisite: Ital 310 or consent of the instructor.

**420. Modern Italian Literature I. 4 Hours.** Eighteenth-century theater: Metastasio, Goldoni, Alfieri. Literary development from Vico to Foscolo. Prerequisite: Ital 311 or consent of the instructor.

**421. Modern Italian Literature II. 4 Hours.** From Romanticism to Decadentism: emphasis on the work of Leopardi and Manzoni; analysis of poems by Carducci, Pascoli, D'Annunzio, Gozzano. Prerequisite: Ital 311 or consent of the instructor.

**422. Contemporary Italian Literature. 4 Hours.** The Novel from Verismo to Umberto Eco: readings from Verga, Svevo, Moravia, Calvino. Hermetic poetry: emphasis on Ungaretti, Montale, Sereni, Luzi. Theater: from Pirandello to Fo. Prerequisite: Ital 322 or consent of the instructor.

**450. Divina Commedia I. 4 Hours.** An in-depth study of the Divine Comedy against the philosophical and theological background of the Middle Ages. Covers Inferno and half of Purgatorio. Prerequisite: Ital 310 or consent of the instructor.

**451. Divina Commedia II. 4 Hours.** An in-depth study of the Divine Comedy against the philosophical and theological background of the Middle Ages. Covers Paradiso and half of Purgatorio. Prerequisite: Italian 310 or consent of the instructor.

**460. Foreign Language Teaching Methodology. 4 Hours.** Same as Span 450 and Fr 481. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisites: Three courses at the 200 and 300 levels.

**461. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**462. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Ital 461, and approval of the department.

## Jewish Studies (Jst)

**478. The Bible as Literature. 4 Hours.** Same as Engl 478 and RelS 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**494. Topics in Jewish Studies. 4 Hours.** May be repeated for a maximum of 6 hours of credit if topic is different for each registration. Selected topics in Jewish studies. Prerequisite: JSt 101 or JSt 102 or consent of the instructor.

## Kinesiology (Kine)

**400. Sport Administration. 3 Hours.** Overview of the total management responsibility of the sport administrator, including planning, organizing, staffing, directing, and controlling the sport enterprise.

**403. Marketing and Facility Management in Exercise and Wellness. 3 Hours.** Introduction to management and marketing principles as they apply to promoting organizations. Theory and practice of managing exercise and wellness facilities.

**407. Facilities Design and Event Management. 3 Hours.** Planning, design, and maintenance of new and remodeled sport facilities; management considerations in conducting various types of events. Prerequisite: Kine 400.

**412. Psychology and Physical Activity. 3 Hours.** Analysis and application of psychological concepts related to process and outcomes of sport and exercise programs.

**413. Curriculum Design and Evaluation. 3 Hours.** Factors contributing to decision-making for curriculum design for various age groups, congruence of design to outcomes, evaluation procedures. Prerequisite: Kine 384 or consent of the instructor.

**415. Urban Youth Fieldwork. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Interview and placement required for each enrollment. Experience in planning, teaching in, and evaluating physical activity-based urban youth programs. Accompanying seminar to examine related literature and explore the interface between theory and practice. Field work required. Prerequisites: Consent of the instructor. Requires interview and placement.

**416. Programs For Underserved Youth. 3 Hours.** Survey and evaluation of physical activity-based models and programs designed to help underserved youth in school, extended day, and special programs. Includes development of new models. Prerequisite: Consent of the instructor.

**417. Physical Activity Programs for the Elderly. 3 Hours.** Effects of aging on motor physiological performance, diagnostic procedures, prescriptive fitness and recreative programs, and instructional processes. Prerequisite: Consent of the instructor.

**418. Exercise Adherence. 3 Hours.** Exercise behavior as it relates to habitual physical activity. Encompasses health outcomes, exercise adherence factors, intervention strategies, and exercise settings.

**420. Adult Fitness Programming and Assessment. 3 Hours.** Emphasis on physiological, psychological, and kinesiological aspects of the physical conditioning process. Diagnostic, prescriptive, and instructional procedures. Prerequisites: Kine 351 and 352; or consent of the instructor.

**421. Advanced Exercise Physiology. 3 Hours.** In-depth study of the mechanisms that underly the acute and chronic responses to physical activity. Extensive computer use required. Prerequisites: Kine 352 and Chem 114; or consent of the instructor.

**422. Exercise Physiology II. 3 Hours.** Cardiovascular, respiratory, environmental, and fluid-electrolyte aspects of exercise and training; relationship to pathogenesis of these systems and exercise.

**423. Theory and Methods of Stress Testing. 3 Hours.** Theory, procedures, and techniques utilized by the exercise technician to evaluate work capacity, body fat, strength, and cardiovascular endurance. Prerequisites: Kine 421 or 422, and consent of the instructor.

**427. Biomechanical Analysis of Sport Techniques. 3 Hours.** The scientific mechanical basis for analyzing the techniques of selected sports to minimize performance errors and maximize results. Prerequisite: Kine 351 or consent of the instructor.

**428. Advanced Functional Anatomy. 3 Hours.** Mechanics and muscular analysis of human motion through the scientific study and application of selected physical principles. Prerequisite: Kine 351.

**429. Biomechanical Analysis of Sport Injuries. 3 Hours.** The biomechanical principles related to sport injuries. Prerequisite: Kine 351.

**452. Qualitative Methods and Evaluation in Physical Education. 3 Hours.** Practical introduction of qualitative research techniques: participant observation, interviewing, and use of documentary and archival sources. Emphasis on naturalistic settings in physical education.

**460. Survey of Adapted Physical Education. 4 Hours.** Characteristics of selected populations of children with disabilities. Emphasis on the relationship of the handicapping condition to motor development, motor learning, physical activity and physical education.

**472. Movement Neuroscience. 3 Hours.** Overview of the human nervous system. Emphasis is placed on the basic functional anatomical and physiological concepts relevant to the organization and execution of movement. Prerequisites: Kine 251, 252, 352, 354; or consent of the instructor.

**481. Workshop in Kinesiology. 1 to 3 Hours.** May be repeated for credit if topic varies for each registration. Intensified study of selected activities, topics, processes, or areas in kinesiology. Topic will be announced.

**490. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the school. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the school.

**491. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the school. The second half of a two-segment sequence of practice teaching, including seminar, to meet

certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Kine 490, and approval of the school.

**494. Special Projects in Kinesiology. 1 to 3 Hours.**

Independent research on special projects. Prerequisite: Approval by graduate faculty member and director of graduate studies.

**501. Sport Law. 3 Hours.** Impact of the legal process on sport; making practical applications of legal principles. Study of actual cases involving sport, deducing from them the principles involved. Prerequisite: Kine 400.

**503. Sport Marketing/Promotion. 3 Hours.** The economic, social and political forces that affect sport. Developing strategies that capitalize on positive influences and neutralize the negative forces that influence the sport enterprise. Prerequisite: Kine 400.

**514. Research on Teaching in Physical Education. 3 Hours.** Major issues, methodologies, and findings will be analyzed to critique the research on teaching in physical education that has emerged over the last two decades. Prerequisite: Kine 590.

**515. Urban Youth Program Evaluation. 3 Hours.** Analysis of the impact of social trends and problems on kinesiology programs. Evaluation of contemporary affective and moral education programs in kinesiology. Prerequisite: 30 hours of kinesiology courses.

**517. Seminar in Urban Youth Development. 3 Hours.** In-depth analysis of topics and issues in the field of youth development, with special attention to the urban context and the role of physical activity. Prerequisites: Grade of B or better in Kine 416; and consent of the instructor.

**520. Exercise Leadership Field Instruction. 3 Hours.** Students are assigned to fitness classes where, under the supervision of a field instructor, they prepare lessons, give instruction and administer written and physical fitness exams. Prerequisite: Kine 420.

**521. Current Research in Kinesiology. 1 Hour.** May be repeated for a maximum of 10 hours of credit with the approval of the School. In-depth analysis of current original research. Prerequisite: Consent of the instructor.

**522. Movement Science. 4 Hours.** Synthesis of the body of knowledge in kinesiology using various diseases as a teaching model. Prerequisite: Consent of the instructor.

**523. Exercise Biology in Health and Disease. 3 Hours.** Same as PhyB 523. Interrelationships between exercise and various pathological conditions. Current research focusing on molecular and cellular mechanisms in healthy and diseased states. Prerequisite: Consent of the instructor.

**524. Exercise Physiology: Training Adaptations and Mechanisms. 3 Hours.** Same as PhyB 524. Metabolic, endocrine, circulatory, respiratory, and molecular biology alterations that occur in response to exercise. Prerequisite: Consent of the instructor.

**526. Experimental Exercise Physiology. 3 Hours.** Animals used in instruction. In-depth analysis of laboratory procedures used in human and animal exercise physiology designed to measure whole body, organ, and/or cellular function. Prerequisite: Kine 421, 422, or consent of the instructor.

**527. Molecular Biology of Muscle Genes and Proteins. 2 Hours.** Regulatory mechanisms which govern gene expression relevant to the function of skeletal and cardiac muscle. Prerequisites: BioS 524 and 525 and consent of the instructor.

**528. Cellular Response to Exercise. 3 Hours.** Examines cellular structure/function relationships important for acute and chronic adaptations to exercise. Emphasis on understanding cellular basis of physiological response to exercise. Prerequisite: BioS 422 or consent of the instructor.

**529. Exercise Genomics. 3 Hours.** Molecular mechanisms by which cells adapt to increases and decreases in physical activity. Emphasis on understanding genomic, transcriptional, translational and post-translational sites of control. Prerequisite: Bche 460 or consent of the instructor.

**530. Clinical Biomechanics of Rehabilitation Exercise. 3 Hours.** The clinical anatomical and biomechanical aspects of sport injuries, their prevention and rehabilitation. Prerequisite: Consent of the instructor.

**531. Field Experience: Sport Injury Management. 3 Hours.** Provides experience in prevention, treatment and rehabilitation

of sports-related injuries under the direct (on-site) supervision of a certified athletic trainer. Prerequisites: Current certification in first aid and CPR and Kine 427, 429, and 530.

**535. Nutrition and Human Performance. 2 Hours.** Same as HN 535. Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. Prerequisites: HN 410 and either PhyB 341 or Kine 352, or consent of the instructor.

**540. Disability and Physical Activity. 3 Hours.** Same as DHD 520. Examination of the foundations of physical activity for persons with disabilities. Emphasis on strategies for promoting physical activity among persons with disabilities in community settings.

**561. Adapted Physical Education Methods. 4 Hours.** Intended for graduate students who have taken the Adapted PE survey course, it is designed to provide the student with knowledge and skills required to meet the professional and legal mandates pertaining to physical education for children with disabilities. Prerequisite: Kine 460.

**562. Advanced Adapted Physical Education. 3 Hours.** An investigation of research and program implications for adapting physical education and/or rehabilitation to mentally and physically impaired persons. Primary multi-handicapping conditions are also addressed. Prerequisites: Kine 460 and consent of the instructor.

**563. Evaluating Performance in Adapted Physical Education. 4 Hours.** A comprehensive treatment of assessment procedures and validated testing instruments, used in classifying, placing, and prescribing instruction in adapted physical education. Prerequisite: Kine 561.

**564. Adapted Physical Education Field Experience. 1 to 5 Hours.** Observation, planning, and program implementation in a variety of school-based and community motor programs for handicapped children. Prerequisites: Kine 563 and consent of the instructor.

**570. Neural Mechanisms Underlying Motor Control. 4 Hours.** Neurophysiological mechanisms that underlie the control and regulation of movement. Prerequisite: Consent of the instructor.

**571. Biomechanics of Normal and Abnormal Movement. 3 Hours.** Same as PT 571. Previously listed as: PT 519. Principles of statics and dynamics exemplified by human movements. Examination of muscle mechanics, joint forces, stability. Redundancy and intersegmental interactions in multijoint movements. Prerequisite: Consent of the instructor.

**572. Psychology of Motor Control and Learning. 3 Hours.** Same as PT 572. Advanced principles of the control and acquisition of complex, voluntary skills. Prerequisite: Kine 354 or consent of the instructor.

**573. Advanced Topics in Motor Control and Learning. 3 Hours.** Contemporary theories and models in motor control and learning.

**574. Instrumentation for Motor Control Research. 3 Hours.** Same as PT 574. Previously listed as: PT 522. Introduction to oscilloscopes, amplifiers, filters, and transducers. Origin and processing of electromyograms. Motion capture and processing techniques. Prerequisite: Kine 571.

**582. Issues and Problems in Kinesiology. 3 Hours.** May be repeated once for credit. Intensive study of selected topics; particular attention to current issues and research literature in kinesiology administration, curriculum and instruction, motor control, adapted physical education and sports management. Prerequisites: 30 hours of kinesiology courses.

**589. Seminar in Kinesiology. 1 Hour.** Final experience for Option I student. Student must demonstrate ability to synthesize material obtained in program and relate it to their area of specialization. Prerequisites: 32 semester hours of graduate credit and consent of the major advisor.

**590. Research Methods in Kinesiology. 3 Hours.** Training in research methods as they pertain to the specific areas of research in kinesiology. A research paper is required. Prerequisites: 30 hours of kinesiology courses at the undergraduate level.

**591. Laboratory Experiences in Kinesiology. 2 Hours.** S/U grade only. Provides laboratory experiences for the PhD students in Kinesiology. Students rotate through the research laboratories in the School. Prerequisite: Acceptance into the PhD program in Kinesiology.

**593. Internship in Kinesiology. 0 to 9 Hours.** Credit is not given for Kine 593 if student has credit in Kine 597. Supervised



internship in a laboratory or field setting. A written report is required. Normally open only to candidates in the administration exercise science and adapted physical education areas of specialization. Prerequisites: Kine 595, completion of 24 semester hours of course work, completion of all coursework in specialization, successful completion of comprehensive examination and consent of the advisor and director of graduate studies.

**594. Selected Topics in Kinesiology. 1 to 3 Hours.** May be repeated for credit if topic varies. Topic to be announced. Analysis of selected problems and concerns in specified specializations. Topics vary from semester to semester, depending on the needs and interests of the graduate students. Prerequisite: Consent of the instructor.

**595. Preparation for the Research Experience in Kinesiology. 3 Hours.** Students in thesis, project, or internship options must complete background work by the end of the semester before they can proceed. Prerequisites: Kine 590 and consent of the instructor.

**596. Independent Research in Kinesiology. 1 to 4 Hours.** Topics vary. Students design, implement, and analyze a research problem in their individual area of specialization under the supervision of a faculty member. Prerequisite: Kine 590 or the equivalent.

**597. Project in Kinesiology. 0 to 16 Hours.** S/U grade only. Supervised practicum in laboratory or field setting in which recent research findings are applied, tested, and evaluated. May be repeated for credit. Prerequisites: Kine 590 and 595, completion of course work in the area of specialization, and consent of the advisor and director of graduate studies.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Thesis work under the supervision of a graduate advisor. Prerequisites: Kine 490 and consent of the graduate advisor.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Independent research by the student under the supervision of the thesis adviser. Prerequisites: Kine 590 and consent of the thesis adviser.

## Latin (Lat)

**450. Latin for Reading Knowledge. 4 Hours.** No credit toward major or minor, or foreign language requirement. May not be taken for credit by students who have completed Lat 103 or 104. No graduate credit. Intensive introduction to Latin grammar and vocabulary. Prerequisite: Knowledge of another foreign language strongly recommended.

**499. Independent Reading. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Individual study under faculty direction. Prerequisite: 4 hours in latin at the 200 level or the equivalent.

## Latin American and Latino Studies (LALS)

**434. Global Communication Systems. 4 Hours.** Same as Comm 434. Structure and flow of international communication. Media organization systems. International impact of new media and information technology. Impact of U.S. media reporting on foreign affairs. Prerequisite: Comm 300 or approval of the department.

**461. Topics in Latin American History. 4 Hours.** Same as Hist 461. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history, latin american and latino studies, or consent of the instructor.

**471. Spanish Culture and Society. 4 Hours.** Same as Anth 471 and Span 471. Introduction to themes in Spanish culture and society based primarily upon the literature in anthropology. Parallel sets of readings in Spanish and English.

**475. Problems in South American Ethnology. 4 Hours.** Same as Anth 475. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given to the influence of Levi-Strauss' ideas on the formulation of cultural theory in South America. Prerequisite: Anth 213 or consent of the instructor.

**491. Interdisciplinary Seminar in Latin American Studies. 4 Hours.** May be repeated for credit if topic is different for each registration. Specific topics as announced each semester. In-

depth study of selected topics such as: process of state formation, education, populism, the family, democratization, industrialization and ideological currents. Prerequisite: Latin American and Latino Studies major or consent of the instructor.

**493. Seminar in Latin American/Latino Cultural Studies. 4 Hours.** Latin American/Latino cultural studies theory and method: everyday life and popular culture, related to socio-economic, political, transcultural/transnational processes. Postmodern, postcolonial and subaltern perspectives. Prerequisite: LALS 101 or 102 or consent of the instructor.

**495. Topics in Latino Community Studies. 4 Hours.** May be repeated for credit if topic is different for each registration. In-depth study of Latino communities and current issues from an interdisciplinary perspective, with emphasis on the learning and use of investigative methodologies. Prerequisite: Latin American and Latino Studies major or consent of the instructor.

**499. Advanced Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Individual advanced reading or research project in Latin American or U.S. Latino studies, with instructor's consent and supervision. Prerequisite: Open, with consent of the instructor, to graduate students and Latin American and Latino Studies majors with at least a 3.00 grade point average. Students in other programs or with lower than a 3.00 grade point average are admitted at instructor's discretion only.

**501. Latinos and Latin America in Transnational Context. 4 Hours.** Analysis of transnational processes linking Latin America and Latinos in the U.S. The impact of globalization on migration, culture, identity, work, health, education, family, and politics.

**561. Colloquium on Latin American History. 4 Hours.** Same as Hist 561. May be repeated for credit. Students may register for more than one section per term. Topics on themes in Latin American history. Specific topics are announced each term.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the direction of a faculty member. Prerequisite: Consent of the instructor.

## Liberal Arts and Sciences (LAS)

**494. Topics in Cultural Studies. 4 Hours.** An interdisciplinary approach to a current cultural debate. Topics will vary. May be repeated for credit if topic is different for each registration. Taught at the Field Museum.

## Linguistics (Ling)

**402. Trial Interaction. 4 Hours.** Same as CrJ 402. Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. Prerequisites: CrJ 261 and CrJ 350, or consent of the instructor.

**405. Introduction to General Linguistics. 4 Hours.** Introduction to the theories and methods of the phonological, morphological, and syntactic analysis of language. The historical development of languages. Language use.

**415. Linguistic Structures I. 4 Hours.** Introduction to key concepts in the field, including descriptive and prescriptive grammars, competence and performance, and human language as a system; articulatory phonetics, phonology, morphology.

**425. Linguistic Structures II. 4 Hours.** Fundamentals of semantics and syntax within the broad frameworks of generative and functional linguistics, including key concepts such as sense reference, utterance, sentence, form and function.

**440. Semantics. 4 Hours.** Introduction to the theories and methods of semantic analysis. Prerequisite: Ling 405 or consent of the instructor.

**453. Dialectology. 4 Hours.** Geographical and social variations in language. Prerequisite: Ling 410 or consent of the instructor.

**456. Language and Gender. 4 Hours.** Same as GWS 456. Examination of current sociolinguistic research and theories on the function of sex categories in linguistic systems and male-female differences in patterns of linguistic usage. Prerequisite: Ling 405 or consent of the instructor.

**459. Topics in Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one



section per term. Topics vary. Prerequisite: Consent of the instructor.

**474. Psychology of Language. 3 Hours.** Same as Comm 454 and Psch 454. Introductory survey of methods, theory, and research; linguistic foundations, history, and present status of the field.

**480. Sociolinguistics. 4 Hours.** Same as Anth 480. Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. Prerequisite: Ling 405 or consent of the instructor.

**483. Methodology of TESOL. 4 Hours.** Same as CIE 483. Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. Prerequisite: Consent of the instructor.

**490. Communication, Culture, and Society. 4 Hours.** Same as Comm 490. Analysis of contrastive cultural paradigms (interethnic, gender, class) to develop student's awareness of own socialization and cultural orientation. Prerequisites: Comm 201 and 203, and at least two 300- or 400-level communication courses; or approval of the department.

**496. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. S/U grade only. Students are assigned to this course at the discretion of the department. Independent study in an area of linguistics not normally covered by regular course offerings. Prerequisites: 9 hours of linguistics and approval of the head of the department.

**506. Cross-Cultural Communication. 4 Hours.** Same as Comm 506. Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (interactional etiquette, discourse rules).

**531. Grammar for TESOL. 4 Hours.** Survey of major grammatical structures and patterns as they relate to TESOL instruction.

**551. Research Practicum in Ethnography/Sociolinguistics. 4 Hours.** Same as Engl 551. May be repeated for a maximum of 12 hours of credit. Conceptualization and implementation of exploratory ethnographic research project. Prerequisite: Engl 485 or previous coursework in ethnographic research.

**556. Second Language Learning. 4 Hours.** An introduction to research findings and methods in second language learning. Prerequisite: Consent of the instructor.

**559. Seminar in Linguistics. 4 Hours.** May be repeated for a maximum of 9 hours of credit. Students may register for more than one section per term. Advanced study in linguistics. Topics vary. Prerequisite: Consent of the instructor.

**572. Developmental Psycholinguistics. 3 Hours.** Same as Comm 524 and Psch 523. Theories, research methods and research findings in the area of language development. Biological, cognitive, and social influence; disorders of language development. Prerequisite: Consent of the instructor.

**582. Qualitative Methods in Communication. 4 Hours.** Same as Comm 580. Qualitative methods course analyzing language and culture patterns. Prerequisite: Comm 501 or consent of the instructor.

**583. Materials and Curriculum Development in TESOL. 4 Hours.** Evaluation, adaptation, and development of curricula, syllabi, and materials for TESOL. Prerequisite: Ling 483.

**586. Classroom Testing for TESOL. 4 Hours.** Theory and practice in the creation and evaluation of classroom tests for TESOL.

**594. Internship in TESOL. 1 to 12 Hours.** S/U grade only. May be repeated for a maximum of 13 hours of credit. Observation, tutoring, and supervised teaching for teachers of English as a second or foreign language. Prerequisites: Ling 583 and consent of the instructor.

**596. Independent Study in Linguistics. 1 to 6 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Students are assigned to this course at the discretion of the department. Independent study and research on a topic other than that approved for a graduate thesis. Prerequisites: Consent of the instructor and approval of the head of the department.

**597. Research in Linguistics. 0 to 16 Hours.** May be repeated for credit with the approval of the department. A maximum of 4 hours of credit may be applied toward the M.A. in Linguistics degree. S/U grade only. Open only to degree candidates. Independent research in linguistics. Prerequisites: Consent of the instructor and the director of graduate studies.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Open only to degree candidates. Students engaged in thesis research and writing are assigned to this course at the discretion of the department. Independent research on a topic approved for a graduate thesis. Prerequisites: Consent of the thesis supervisor and approval of the head of the department.

## Lithuanian (Lith)

**410. Structure of Lithuanian. 4 Hours.** Synchronic analysis of the structure of Lithuanian; emphasis on discourse analysis of oral and written texts. Prerequisite: 18 hours of Lithuanian or the equivalent or Ling 405.

**425. Translation of Lithuanian Texts. 4 Hours.** Problems of translating Lithuanian texts; workshop in translating Lithuanian works into English. Prerequisite: Lith 302 or consent of the instructor.

**499. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

**510. History of Lithuanian Language. 4 Hours.** Development of Lithuanian from its Indo-European origins to the formation of the standard language; the aspects of Lithuanian literary language and its lexical, syntactical and stylistic problems.

**515. Lithuanian Linguistics and Poetics. 4 Hours.** Linguistic and stylistic analysis of Lithuanian texts based on contemporary theories of style.

**545. Lithuanian Renaissance and Baroque Literature. 4 Hours.** Lithuanian prose, poetry, and historical works of the sixteenth, seventeenth, and eighteenth centuries.

**550. Studies in Lithuanian Romanticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a genre, movement, or topic. Content varies.

**560. Studies in Lithuanian Realism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

**565. Studies in 20th Century Lithuanian Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, author or movement. Content varies.

**570. Studies in Lithuanian Literary Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Function of literary criticism in all epochs of Lithuanian literature.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

## Management (Mgmt)

**430. Family Business Management. 3 Hours.** Competitive strengths/weaknesses of a family business, dynamics of family interactions within the overlapping family, management and ownership systems. Prerequisites: Consent of the instructor. Prior experience in a family business is recommended.

**444. Industrial Sociology. 4 Hours.** Same as Soc 444. Analysis of industrial society and industrial institutions; the meaning of work and work relations; technology and economic change. Prerequisites: 6 hours of upper-division sociology or management or consent of the instructor.

**445. Organizational Analysis and Practice. 3 Hours.** Emphasis on organizational theories and models to analyze and improve functioning and performance of organization. Structure, technology, environmental adaptation, and managerial control systems are considered. Prerequisite: Mgmt 340.

**446. Social Organizations of National Economies. 4 Hours.** Same as Soc 446. Economic institutions, organizations, activity, and development in different societies. Demographic, technological, political, international, cultural and social influences on markets, enterprises, labor, land, capital, consumption and distribution. Prerequisite: 6 hours of upper-division sociology, management, economics, or political science; or consent of the instructor.

**447. Organizations. 4 Hours.** Same as Soc 447. Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisite: 6 hours of upper-division sociology, management, or political science; or consent of the instructor.

**452. Organizational Behavior. 3 Hours.** Emphasis on understanding and managing people at work. Analysis of individual, group and organization topics including leadership, motivation, attitudes, group dynamics, and organizational culture. Prerequisite: Mgmt 340.

**453. Human Resource Management. 3 Hours.** Examination of the activities involved in attracting, retaining, and motivating employees. Topics include planning, selection, compensation, performance appraisal, succession, and legal issues. Prerequisites: Mgmt 340 and 350.

**454. Labor-Management Relations. 3 Hours.** Labor unions and their impact on business firms and society. Labor-management relationships and collective bargaining practices. Public policy, union structure, and bargaining theory. Prerequisites: Mgmt 340 and 350.

**455. Entrepreneurship: New Venture Formation. 3 Hours.** Same as Mktg 454. Awareness and realistic understanding of the new venture formations process, role of the entrepreneur in the economy and society, entrepreneurial characteristics overview and self-evaluation. Prerequisites: Fin 300, Mgmt 340, and Mktg 360 or consent of the instructor.

**460. Business, Society, and the Global Economy. 3 Hours.** Managing in a free enterprise system. Market, regulatory, ethical, and cultural norms. Internationalization of business; urban problems of business; landmark and contemporary case analyses. Prerequisites: Mgmt 340 and 350.

**463. Negotiation and Conflict Resolution. 3 Hours.** Strategies and techniques for successful agreement negotiation and business conflict resolution. Includes applications to classic situations such as collective bargaining, interpersonal relations, and stakeholder concerns. Prerequisite: Mgmt 340.

**465. Compensation and Reward Systems. 3 Hours.** Examination of compensation and reward systems designed to enhance employee motivation and performance. Topics include pay structure design, incentive systems, and benefits. Prerequisites: Mgmt 453 and 454.

**466. Managerial Effectiveness Through Diversity. 3 Hours.** Management of diverse work forces. Discrimination, affirmative action, career development, socialization and social change policies; historical, psychological, sociological, legal and managerial viewpoints. Prerequisite: Mgmt 340.

**467. Impact of Technological Change. 3 Hours.** Examines the impact of technological change upon the business environment and the managerial process. Emphasis on alternative futures and the planning necessary to attain desired ends. Prerequisites: Mgmt 340 and 350.

**470. Career Planning and Development. 3 Hours.** Individual and organizational perspectives in career planning. Self-direction, networking, support facilities, and corporate management systems are considered. Prerequisite: Mgmt 340 or the equivalent.

**471. Management and Organizational Development. 3 Hours.** Strategies for promoting the creativity, flexibility, and productivity of the organization and its management personnel. Readings and case studies from the public and private sectors. Prerequisites: Mgmt 340 and 452 or consent of the instructor.

**479. Contemporary Management Philosophies and Practices. 3 Hours.** Presentations by business and government executives. Emphasis on problems faced by contemporary senior management and their effects upon the organization. Students make group presentation and case analysis. Prerequisites: Mgmt 340 and 350 or consent of the instructor.

**480. Transportation Systems Management. 3 Hours.** Provides a fundamental knowledge of problems and practices encountered in the management of transportation systems. Includes impact of public policy, capital facilities, industry structure, costs, operations pricing, and environmental relationships. Prerequisites: Mgmt 340 and 350 or consent of the instructor.

**481. Managerial Logistics. 3 Hours.** Management of activities governing the flow of materials and products through stages of production and distribution. Includes design of logistical systems and use of mathematical techniques. Prerequisite: IDS 355 or consent of the instructor.

**482. Urban Mass Transportation Systems Management. 3 Hours.** The managerial, economic, and environmental aspects of urban transit. Includes development, federal role in financing, labor relations, pollution, social benefits, and marketing urban transit. Prerequisites: Mgmt 340 and 350 or consent of the instructor.

**483. Transportation and Public Policy. 3 Hours.** Relationship between government and transportation in the United States. Topics include the evolution of transport policy, problems in transport regulation, and current issues in public policy. Prerequisite: Mgmt 480 or consent of the instructor.

**484. Quality Management in Business. 3 Hours.** Managing quality in organizations. The economic of quality; analytical tools for quality measurement and control; creating a quality culture; and motivation for quality. Prerequisites: Engl 161, Econ 218, and IDS 270.

**485. Business Ethics. 3 Hours.** Leading theories of ethics and moral choice. Analysis of ethical problems in business. Guidelines for ethical decision-making. Case studies in business ethics. Prerequisites: Mgmt 340 and Mgmt 350.

**494. Special Topics in Management. 3 Hours.** Exploration of areas not covered in existing course offerings or study of selected topics in greater depth. Subject matter will vary from semester to semester. Prerequisite: 9 hours of 400-level management courses, or consent of the instructor.

**495. Competitive Strategy. 4 Hours.** Multidisciplinary analysis of organization strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

**499. Independent Study in Management. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Independent study of an approved topic in management. Student must prepare a written report under the guidance of the instructor. Prerequisite: Consent of the department head.

**502. Entrepreneurship. 4 Hours.** No credit given if the student has credit in MBA 510. Same as Mktg 502. Launching new ventures and entrepreneurial companies; components of successful business plans and feasibility studies; perceptual processes of opportunity recognition; entrepreneurial creativity and innovation. Career opportunities. Prerequisites: Actg 500 and Mktg 500 or the equivalent courses.

**519. Advanced Seminar in Management. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced seminar devoted to special topics in management. Prerequisite: Consent of the instructor.

**540. Organizational Analysis and Practice. 4 Hours.** Organizational analysis and applications based on key organization theories; structure, technology, environmental adaptation, management functions and controls, formal and informal organization. Prerequisites: Admission to the MBA or MS in Accounting program.

**541. Organizational Behavior. 4 Hours.** No credit given if the student has credit in MBA 505. The organization as a social system. Topics include leadership, interpersonal effectiveness, group behavior, managing change, conflict management, motivation and behavior, and interpersonal communications. Prerequisite: Admission to MBA or MS in Accounting program.

**553. Human Resource Management. 4 Hours.** Human resource management programs and policies. Staffing, training and development; historical evolution of personnel policies, modern labor force and technological trends; supervision, wage and salary administration, human resource research and utilization. Prerequisite: Mgmt 541.

**554. Collective Bargaining and Managerial Processes. 4 Hours.** Structure and conduct of collective bargaining and the effects of collective representation on the managerial function in public, private, and nonprofit institutions. Prerequisite: Mgmt 541 or the equivalent.

**555. Entrepreneurship: New Venture Formation. 4 Hours.** Same as Mktg 555. Awareness and understanding of new venture creation and/or acquisition by developing a plan for a business; assessment of personal entrepreneurial potential. Prerequisite: Mgmt 502; or consent of the instructor.

**556. Policy Issues in Labor Relations. 4 Hours.** Policy issues involving unions in the private and public sector. Includes wage

control, strike substitute procedures, labor law, foreign trade, industry regulations, and worker participation. Prerequisite: Mgmt 554 or the equivalent.

**557. International Management. 4 Hours.** Management practices and problems in major nations. Legal and cultural factors affecting managerial policies and decisions; organization planning and manpower utilization; comparative management systems and ideologies. Prerequisite: Mgmt 541.

**558. Entrepreneurial Electronic Commerce. 4 Hours.** Same as Mktg 558. The role of electronic commerce in entrepreneurship; competitive practices, marketing strategies, financing options, creating an e-commerce business plan. Prerequisites: Actg 500 or MBA 501; and Mktg 500 or MBA 506.

**563. Seminar: Topics in Collective Bargaining. 4 Hours.** Recent developments in both the private and public sectors related to the collective bargaining process. Prerequisite: Mgmt 554.

**565. Human Resource Planning and Development. 4 Hours.** Analysis of career management and human resource planning and development. Topics include human resource planning programs, appraisal and assessment systems; development strategies, theories and approaches. Prerequisite: Mgmt 553.

**566. Human Resource Information Systems. 4 Hours.** Utilization in organization settings. Problems of design, user acceptance, implementation, usage, and evaluation of human resource management information systems. Prerequisite: Mgmt 553 or the equivalent.

**567. Personnel Administration Law. 4 Hours.** Government regulation of the terms and conditions of employment, including equal employment opportunity, unemployment compensation, disability compensation, health and safety, worker privacy and due process. Prerequisite: Mgmt 553.

**568. Compensation Administration. 4 Hours.** Compensation theory policies and practices, including job analysis and evaluation, compensation surveys, wage and salary structures, merit and incentive compensation employee benefits and pension plans. Prerequisite: Mgmt 553.

**569. Seminar: Behavioral Science and Modern Resource Management. 4 Hours.** Theories in the behavioral sciences, changes in American organizations and the structures, and approaches of personnel and resource management. Prerequisite: PhD student status or consent of the instructor.

**570. Social and Legal Environment of the Firm. 4 Hours.** Exploration of current ethical, social, political, technological, economic, and global issues as they relate to business and management in setting goals, making decisions, and creating policy. Prerequisite: Econ 520.

**573. Research Methods in Organizational Behavior and Human Resource. 4 Hours.** Methodologies and industrial design appropriate for research in human resource and relations management, and organizational behavior. Students expected to complete a theoretically based research paper. Prerequisite: Mgmt 569, PhD student status, or consent of the instructor.

**575. Seminar: Topics in Personnel Practices and Relations. 4 Hours.** Relationships among work environment, compensation, unions and workers' performance. Emphasis on legislation affecting employee selection, rewards, and the quality of work life. Prerequisite: Mgmt 569, PhD student status, or consent of the instructor.

**576. Behavioral Science Applications in Human Resource Management. 4 Hours.** Applies concepts, structures, theories and methods of organizational behavior to develop techniques useful for research and practice at the micro level of human resource management. Prerequisite: Mgmt 569, PhD student status, or consent of the instructor.

**577. Employment, Selection, and Placement. 4 Hours.** Selection and placement of personnel based on theory and practical approaches. Focus on planning models, current methods, legal considerations. Development of applied skills.

**578. Organization and Management Development. 4 Hours.** The theories, analytic approaches and skills development needed for introducing organizational change affecting units, task groups and individuals and for establishing good working relationships. Prerequisite: Mgmt 541.

**579. Contemporary American and International Management. 4 Hours.** Student teams evaluate case studies,

present findings and recommendations for business strategies and research corporations of visiting executives, prepare presentations, and critique lectures.

**580. Strategic Planning. 4 Hours.** The process of strategic planning in complex organizations. Skill in development and evaluation of strategy is facilitated through use of business simulation and case analyses. Prerequisite: Mgmt 541.

**581. Administrative Structure and Organizational Design. 4 Hours.** An advanced exploration of theories of administrative structure and organizational design. Course topics include: conceptual models; macro, middle and micro level variables and principles and strategies of organizational change and development. Prerequisite: Mgmt 541.

**582. Management of Innovation and Technological Change. 4 Hours.** Analysis of the role of organization structure and management processes in fostering innovation. Emphasis on issues in research and development, flexible manufacturing, government policy, and technology transfer. Prerequisite: Mgmt 541.

**587. Seminar: Topics in Organizational Behavior and Human Resources. 4 Hours.** Topics of current research interest in human resource systems and organizational behavior. Focuses on current issues in published literature and unpublished research. Prerequisite: Mgmt 569, PhD student status, or consent of the instructor.

**588. Seminar: Topics in Strategic Management. 4 Hours.** Selected topics and current problems in organizational strategy. Research and field work in strategic planning. Application of theory and concepts to problems in strategic management. Prerequisite: Mgmt 541.

**589. Seminar: Topics in Human Resource Management. 4 Hours.** Recent literature including parameters of the field, system designs and applications, information systems, and studies of work systems, quality of work life, productivity and career management. Prerequisite: Mgmt 569, PhD student status, or consent of the instructor.

**590. Seminar in Policy. 4 Hours.** Study of strategies and policies that influence the long-term survival, growth, and character of business firms; strategy formulation and implementation in domestic and international organizations. Prerequisite: Enrollment in the final year of the MBA program.

**591. Research Apprenticeship. 2 to 4 Hours.** May be repeated for credit. S/U grade only. Directed training in conducting research in specific areas of management, and in developing skills related to the research. Prerequisite: Consent of the instructor.

**594. Special Topics in Management. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. An intensive study of a selected topic in management. Topics vary by section and by term. Prerequisite: Consent of the instructor.

**596. Independent Study in Management. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Independent study under direction of a faculty member. Prerequisite: Consent of the head of the Department of Management.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Students may register for more than one section per term. Independent research on topic approved for the doctoral dissertation. Prerequisite: Consent of the instructor.

## Marketing (Mktg)

**452. Principles of Retailing. 3 Hours.** Theory and practice in the making of retailing decisions; merchandising policies, buying policies, and activities; pricing policies and practices, promotional policies, credit policies, and practices. Prerequisite: Mktg 360.

**454. Entrepreneurship: New Venture Formation. 3 Hours.** Same as Mgmt 455. Awareness and realistic understanding of the new venture formations process, role of the entrepreneur in the economy and society, entrepreneurial characteristics overview and self-evaluation. Prerequisites: Fin 300, Mgmt 340, and Mktg 360 or consent of the instructor.

**461. Consumer Market Behavior. 3 Hours.** Understanding consumer decision processes; steps in decision making, including need recognition, perception, cognition and attitude formation; effect of environmental social, psychological, and individual difference factors on consumer decision making. Prerequisite: Mktg 360 or consent of the instructor.



**462. Marketing Research. 3 Hours.** An investigation of the gathering, analyses and interpretation of information used in solving marketing problems. Pertinent modern research techniques from mathematics and the behavioral sciences are employed in developing an analytical framework. Prerequisites: Mktg 360.

**463. Marketing Channels. 3 Hours.** Principles of developing an integrated distribution system; relationship to firm's marketing structure; evaluation of decisions on sources; evaluation of decisions on raw-material sources, plant and warehouse location, outlets; analysis of products through marketing channels. Prerequisites: Mktg 360. Business administration students must have declared a major, or have received consent of the instructor.

**464. Small Business Consulting. 3 Hours.** Student teams diagnose and recommend solutions to problems of Chicago-area small businesses with assistance of retired executives and U.S. Small Business Administration personnel. Prerequisites: Econ 218, Fin 300, Mgmt 340, Mgmt 350, Mktg 360, and IDS 355.

**465. Marketing Management. 3 Hours.** Seminar. Development of marketing plans and programs to achieve the firm's marketing objectives. Emphasis on individual and group research and presentation of plans from the perspective of the marketing manager. Business case analysis. Prerequisite: 15 hours of marketing.

**466. Comparative Marketing Systems. 3 Hours.** Treats the topic of domestic marketing systems in other countries, their structures and processes, in a framework of comparative cultural, political, economic, and social systems. Prerequisites: Mktg 360 or consent of the instructor. Business administration students must have declared a major.

**469. International Marketing. 3 Hours.** How firms sell across international frontiers; problems of product modification, pricing, intercultural communication, preparation for shipment, documentation. Focuses on small firms and multinational corporations. Prerequisite: Mktg 360 or consent of the instructor.

**473. The Personal Selling Effort in Marketing. 3 Hours.** Analysis of selling strategies and tactics in different situations, problems of managing sales force. Emphasis will be placed on applications of the behavioral sciences. Prerequisite: Mktg 461 or consent of the instructor.

**474. Advertising and Sales Promotion. 3 Hours.** The management, planning, creation, evaluation, and use of advertising and sales promotion. Prerequisite: Mktg 461 or consent of the instructor.

**475. Product Management. 3 Hours.** Development and review of new and existing products during their life cycles, the evolution of products and services from a creative idea to their withdrawal from the market. Prerequisite: Mktg 462 or consent of the instructor.

**476. Industrial Marketing. 3 Hours.** Unique concepts and strategies applied when businesses market to other organizations and institutions. Derived demand, systems selling, bid pricing, national account programs, and using distributors. Prerequisite: Mktg 360 or consent of the instructor.

**494. Special Topics in Marketing. 3 Hours.** Intensive study of selected problems. Reading assignments from scholarly and professional journals, emphasis on covering relatively few areas in great depth. Prerequisite: Business administration students must have declared a major.

**499. Independent Study in Marketing. 3 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Topic and research methodology is to be determined by consultation with the instructor. Prerequisites: Major in marketing. Consent of the head of the department and the instructor must be obtained prior to registration.

**500. Introduction to Marketing. 4 Hours.** No credit given if the student has credit in MBA 506. Client/consumer behavior and the way institutions respond to such behavior through the planning, pricing, promotion, and distribution of goods and services. Prerequisite: Consent of the instructor.

**502. Entrepreneurship. 4 Hours.** No credit given if the student has credit in MBA 510. Same as Mgmt 502. Launching new ventures and entrepreneurial companies; components of successful business plans and feasibility studies; perceptual processes of opportunity recognition; entrepreneurial creativity and innovation. Career opportunities. Prerequisites: Actg 500 and Mktg 500 or the equivalent courses.

**510. Introduction to Health Care Marketing. 4 Hours.** The relevance and workings of marketing in the health care system.

Goal determination, environmental considerations, strategic planning. Prerequisite: Enrollment in a health administration program or consent of the instructor.

**518. Electronic Marketing. 4 Hours.** Same as IDS 518. Overview of the electronic marketing value chain. Internet and web technologies, system design, payment systems, business requirements for e-marketing, design and ethical issues. Prerequisite: Mktg 500 or MBA 506 or consent of the instructor.

**550. Marketing and Public Policy. 4 Hours.** Impact of public policy on marketing behavior of the firm; product development, pricing freedom, promotion practices, distribution arrangements. Society's need for marketing regulation; its process and effect. Prerequisite: Mktg 500.

**555. Entrepreneurship: New Venture Formation. 4 Hours.** Same as Mgmt 555. Awareness and understanding of new venture creation and/or acquisition by developing a plan for a business; assessment of personal entrepreneurial potential. Prerequisite: Mktg 502; or consent of the instructor.

**558. Entrepreneurial Electronic Commerce. 4 Hours.** Same as Mgmt 558. The role of electronic commerce in entrepreneurship; competitive practices, marketing strategies, financing options, creating an e-commerce business plan. Prerequisites: Actg 500 or MBA 501; and Mktg 500 or MBA 506.

**560. Marketing Management. 4 Hours.** The structural system for the management of marketing: environmental considerations; goal determinations; the sequential process; marketing planning; product-market integration; channel components; demand stimulation; evaluation and audit. Prerequisite: Mktg 500; or consent of the instructor.

**561. Consumer Behavior. 4 Hours.** Application of knowledge from the behavioral sciences to the study of consumer behavior. Individual and group influences on consumer preferences and purchasing patterns are considered. Both theory and application are stressed. Prerequisite: Mktg 500.

**563. Information for Marketing Decisions. 4 Hours.** Definition and selection of appropriate research techniques for solving specific marketing problems. Establishment and administration of information systems giving firms a systematic, continuing appraisal of its market position. Prerequisite: Mktg 500.

**565. Marketing Communication and Promotional Strategy. 4 Hours.** How a firm uses advertising, public relations, sales promotion, and personal selling to communicate with its customers. The functional characteristics of each of these is assessed in terms of varying marketing situations in the process of formulating the firm's strategy. Prerequisite: Mktg 500.

**571. International Business Operations. 4 Hours.** Centers attention on the policies and problems of firms operating across international frontiers and the social questions they generate. Attention is directed at investing overseas, licensing agreements, joint ventures and contracting. Prerequisite: Mktg 500.

**572. International Marketing. 4 Hours.** Focuses on firms which operate internationally from their home country base. Attention is directed toward working with overseas distributors, promotion and pricing problems, governmental export assistance, and physical distribution matters. Prerequisite: Mktg 500.

**573. Marketing Channels Management. 4 Hours.** Operations of various institutions that constitute the channel(s) for marketing goods and services. Emphasis on the practices of institutions at each level in the distribution system and the interaction that occurs among them. Prerequisite: Mktg 500.

**574. Product Planning. 4 Hours.** In-depth coverage of all aspects of the product, service, and program planning process. Conceptual aspects as applied to new and existing product entries. Prerequisite: Mktg 500.

**576. Industrial Marketing. 4 Hours.** Buyer behavior, industrial segmentation, derived demand, national account programs, system selling, bid pricing. Industrial promotion mix, mass communications and management of sales force. Prerequisite: Mktg 500.

**581. Seminar in Consumer Behavior. 4 Hours.** Theories and concepts relevant to consumer behavior; the decision-making process for both profit and nonprofit goods and services. Prerequisite: Admission to the PhD program in Business Administration.



**583. Seminar on Marketing Theory. 4 Hours.** Emphasis on marketing literature evolution and development of marketing practices that reflect/influence the basic literature. Attention devoted to how other fields have contributed to marketing thought. Prerequisite: Admission to the PhD program in Business Administration.

**584. Product Innovation and Development. 4 Hours.** An in-depth investigation of the factors affecting the new product strategy of the firm and its management of product innovation. Prerequisite: Admission to the PhD program in Business Administration.

**585. Seminar: Topics in Quantitative Models in Marketing. 4 Hours.** Formulation of conceptual and quantitative models that relate marketing activities and behaviors to other behaviors or sales or profits. Examines methods that researchers have used to test hypothesized marketing models. Prerequisite: Admission to the PhD program in Business Administration.

**586. Advanced International Marketing. 4 Hours.** Concepts and problems pertaining to export marketing with emphasis on multinational businesses. Includes product modification, differential pricing, national social and commercial policies, promotion, logistical issues. Prerequisite: Admission to the PhD program in Business Administration.

**587. Advanced Marketing Research. 4 Hours.** Multi-dimensional scaling, conjoint analysis including hybrid analysis, choice models including multinomial logit and probit models, selectivity models. Prerequisite: Admission into the PhD program in Business Administration.

**588. Marketing Communications. 4 Hours.** The firm's use of the elements of the promotion mix; advertising, personal selling, sales promotion, publicity and public relations for effective communication with its markets. Prerequisites: Admission to PhD program in Business Administration and consent of the instructor.

**589. Services Marketing. 4 Hours.** Distinctive aspects of services marketing examined from both a conceptual and managerial perspective with focus on the research frontiers and questions in services marketing. Prerequisite: Admission to the PhD program in Business Administration.

**591. Pricing Theory and Practice. 4 Hours.** Advanced study of pricing concepts and areas of application including price sensitivity, competitive issues and product lines, life cycle, psychological, and legal issues. Prerequisite: Admission to the PhD program in Business Administration.

**594. Special Topics in Marketing. 4 Hours.** An intensive study of a selected topic in marketing. Topics vary. Students should contact the instructor to find out what topics will be covered. Prerequisite: Mktg 500.

**596. Independent Study in Marketing. 1 to 4 Hours.** Students may register for more than one section per term. Independent study under the direction of a faculty member. Prerequisite: Enrollment by petition to the director of the MBA program.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Students may register for more than one section per term. Independent research on topic approved for the doctoral dissertation. Prerequisite: Consent of the instructor.

## **Master of Business Administration (MBA)**

**590. Professional Topics. 2 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. A series of skills workshops designed to develop critical management skills and to explore timely management issues not directly related to core business functional areas. Prerequisite: Admission to the MBA program.

**591. Study Abroad—MBA Program. 0 to 16 Hours.** May be repeated for a maximum of 24 hours of credit. Lectures, seminars, and independent travel/study abroad in conjunction with admission to the MBA program. Prerequisites: Admission to the MBA program and consent of the director.

**592. MBA Project. 8 Hours.** Multi-disciplinary team project at an outside company or University office. A written report and an oral presentation of the project is required. Prerequisites: Admission to the MBA program and consent of the MBA program director.

**594. Special Topics—MBA Program. 2 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. An intensive study of a selected business topic not available in current course offerings. Subject matter

will vary by section and semester. Prerequisite: Admission to the MBA program.

**596. Independent Study. 0 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. Independent study under the direction of a faculty member. Prerequisite: Enrollment by petition to the director of the MBA Program.

## **Maternal-Child Nursing (NuMC)**

**507. Scientific Basis for Women's Health and Perinatal Nursing I. 2 Hours.** Same as NuWH 507. Focuses on anatomy, physiology and endocrinology of reproduction, pregnancy, labor and birth as scientific basis for women's health and perinatal nursing. Prerequisite: Consent of the instructor.

**508. Scientific Basis for Women's Health and Perinatal Nursing II. 2 Hours.** The anatomy, physiology, and genetics of conception, embryonic development, and fetal and neonatal growth and development as scientific basis for women's health and perinatal nursing. Prerequisite: NuMC 507 or consent of the instructor.

**510. Advanced Nursing Care of the Well Infant, Child, and Adolescent. 3 Hours.** Emphasizes prevention, health promotion and maintenance for all childhood age groups through teaching, counseling, guidance and support of children and their families. Prerequisite: Credit or concurrent registration in NuSc 530 or consent of the instructor.

**511. Primary Care Management of Acute/Chronic Conditions in Childhood. 3 Hours.** Emphasizes clinical decision making and management of acute episodic illnesses and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuSc 530 and NuSc 531, or consent of the instructor.

**512. Practicum in Advanced Pediatric Primary Care I. 1 to 6 Hours.** May be repeated for credit. Emphasizes clinical experiences in prevention, health promotion and maintenance through teaching, counseling, guidance and support of children and their families. Prerequisites: Credit or concurrent registration in NuMC 510 and in NuSc 532, or consent of the instructor.

**513. Practicum in Advanced Pediatric Primary Care II. 1 to 6 Hours.** May be repeated for credit. Emphasizes clinical experiences and management of acute episodic and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuMC 512 or consent of the instructor.

**514. Practicum in Advanced Pediatric Primary Care III. 1 to 6 Hours.** May be repeated for credit. Emphasizes clinical experiences that integrate prevention, health promotion and maintenance, and clinical management of acute episodic and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuMC 513 or consent of the instructor.

**515. Advanced Parent-Infant Nursing. 3 Hours.** Examines the process of parenting in low-risk and at-risk populations, and health status and behavior of the neonate. Prerequisite: NuMC 508 or consent of the instructor.

**516. Advanced Nursing Care of Perinatal and Pediatric Health Problems. 4 Hours.** Integration of theory and research into the management/care of selected clinical problems in maternal-child populations. Prerequisite: NuMC 508 or NuSc 530 or the equivalent.

**517. Health Care of Women I. 5 Hours.** Same as NuWH 517. Health care of women from adolescence to senescence with emphasis on human sexuality, control of fertility, sexually transmitted diseases, and antepartum care. Prerequisite: Credit or concurrent registration in NuMC 508 or consent of the instructor.

**518. Health Care of Women II. 5 Hours.** Same as NuWH 518. Health care of women from adolescence to senescence with emphasis on intrapartum, postpartum, common gynecologic problems, and management of other common conditions. Prerequisite: NuMC 517 or consent of the instructor.

**520. Practicum in Advanced Maternal-Child Nursing I. 3 Hours.** Advanced nursing assessment and management of perinatal and pediatric clients. Emphasis on assessment of health status, family dynamics, home environment and community resources. Prerequisites: NuMC 515 and 516.

**521. Practicum in Advanced Maternal-Child Nursing II. 3 Hours.** Advanced nursing assessment and management of a selected

caseload of perinatal and pediatric clients. Students will develop beginning clinical nurse specialist competencies. Prerequisite: NuMC 520.

**525. Practicum: Health Care of Women. 1 to 8 Hours.** May be repeated for credit. Clinical experiences to develop nurse-midwifery and nurse practitioner competence in the health care of low- to moderate-risk women. Prerequisite: Consent of the instructor.

**526. Practicum: Antepartum. 1 to 8 Hours.** May be repeated for credit. Clinical experiences to develop beginning competence in nurse-midwifery and nurse-practitioner assessment and management of antepartum care of low- to moderate-risk women. Prerequisite: Consent of the instructor.

**527. Practicum: Postpartum and Neonate. 1 to 8 Hours.** May be repeated for credit. Clinical experiences to develop beginning competence in nurse-midwifery and nurse practitioner assessment and management of postpartum care of low- to moderate-risk women and their neonates. Prerequisite: Consent of the instructor.

**528. Practicum: Intrapartum. 1 to 8 Hours.** May be repeated for credit. Clinical experiences to develop beginning competence in nurse-midwifery assessment and management of intrapartum care of low- to moderate-risk women. Prerequisite: Consent of the instructor.

## Mathematical Computer Science (MCS)

**401. Computer Algorithms I. 4 Hours.** Same as CS 401. Design and analysis of computer algorithms. Divide-and-conquer, dynamic programming, greedy method, backtracking. Algorithms for sorting, searching, graph computations, pattern matching, NP-complete problems. Prerequisites: Grade of C or better in Stat 381 and MCS 360; or CS 360.

**411. Compiler Design. 4 Hours.** Same as CS 473. Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. Prerequisites: Grade of C or better in either CS 361 or MCS 441, and in either CS 360 or MCS 360 and CS 365.

**415. Programming Language Design. 4 Hours.** Same as CS 476. Definition, design and implementation of programming languages. Syntactic and semantic description; variable bindings, control and data structures; parsing, code generation, optimization; exception handling; data abstraction. Prerequisites: MCS 261 and 275; or CS 370.

**421. Combinatorics. 4 Hours.** The pigeonhole principle, permutations and combinations, generating permutations and combinations, binomial coefficients, inclusion-exclusion principle, recurrence relations and generating functions, special counting sequences, Polya theory of counting. Prerequisites: Grade of C or better in MCS 261 or EECS 360; and in Math 310 or 320 or 330.

**423. Graph Theory. 4 Hours.** Basic concepts of graph theory including Eulerian and hamiltonian cycles, trees, colorings, connectivity, shortest paths, minimum spanning trees, network flows, bipartite matching, planar graphs. Prerequisites: Grade of C or better in MCS 261 or EECS 360; and in Math 310 or 320 or 330.

**425. Codes and Cryptography. 4 Hours.** Mathematics of communications theory, basic information theory necessary to understand both coding theory and cryptography, basic ideas and highlights for both coding theory and cryptography, including public-key cryptosystems. Prerequisites: Grade of C or better in MCS 261 or EECS 360; and in Math 310 or 320 or 330.

**441. Theory of Computation I. 4 Hours.** Introduction to formal languages; relations between grammars and automata; elements of the theory of computable functions. Prerequisite: Grade of C or better in MCS 261 or EECS 360.

**451. Object-Oriented Programming in C++. 4 Hours.** No credit given if the student has credit in CS 474. C++ as an object-oriented language, classes and member functions, access control, class scope, constructors, destructors, overloading, conversions, streams, derived classes, polymorphism through virtual functions, templates, class libraries. Extensive computer use required. Prerequisite: Grade of C or better in MCS 360 or the equivalent; or consent of the instructor.

**471. Numerical Analysis. 4 Hours.** Introduction to numerical analysis; floating point arithmetic, computational linear algebra, iterative solution to nonlinear equations, interpolation, numerical integration, numerical solution of ODEs, computer subroutine packages. Prerequisite: Grade of C or better in MCS 275 or in EECS 170 or in EECS 171; or consent of the instructor.

**481. Computational Geometry. 4 Hours.** Algorithmic problems on sets of points, rectangles, intervals, arcs, chords, polygons. Counting, reporting, location, intersection, pairing; static and dynamic data structures. Prerequisite: Grade of C or better in MCS 401 or consent of instructor.

**494. Special Topics in Computer Science. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Topics in mathematical computer science, such as symbolic computation, automated reasoning, cryptography or geometric algorithms. Prerequisite: Approval of the department.

**496. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.

**501. Computer Algorithms II. 4 Hours.** Same as CS 501. Continuation of MCS 401 (same as CS 460). Advanced topics in algorithms. Lower bounds. Union-find problems. Fast Fourier transform. Complexity of arithmetic, polynomial, and matrix calculations. Approximation algorithms. Parallel algorithms. Prerequisite: MCS 401.

**503. Mathematical Methods for Algorithm Analysis. 4 Hours.** Discrete mathematical techniques useful in algorithm analysis: summation methods, floor/ceiling expressions, modular arithmetic techniques, harder binomial identities, special numbers, generating functions, asymptotics. Prerequisites: Grade of C or better in MCS 401 and MCS 421.

**504. Mathematics and Information Science for Industry Workshop. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. A project-based course on one or more topics in applied mathematics, statistics, or computer science, motivated by industrial problems. The topics vary from year to year. Prerequisites: a grade of B or better in MCS 401, 471 and 507.

**507. Mathematical, Statistical, and Scientific Software. 4 Hours.** The design, analysis, and use of mathematical, statistical, and scientific software. Prerequisite: A grade of B or better in MCS 360 or an equivalent course; or consent of the instructor.

**521. Combinatorial Optimization. 4 Hours.** Combinatorial optimization: network flows, bipartite matching, Edmonds algorithm for non-bipartite matching, the matching polytope, matroids, greedy algorithm, matroid union and intersection algorithms, matroid polyhedra, polymatroids. Prerequisites: MCS 423 and Stat 471.

**531. Error-Correcting Codes. 4 Hours.** Finite fields, cyclic codes, quadratic residue codes, BCH codes, decoding schemes. Reed-Muller codes, weight distributions, codes and designs. Prerequisites: Grade of C or better in MCS 261, and in Math 310 or Math 330.

**541. Computational Complexity. 4 Hours.** Time and space complexity of computations, classification of math problems according to their computational complexity, P not equal NP problem. Prerequisite: Consent of the instructor.

**542. Theory of Computation II. 4 Hours.** Undecidability and computational complexity. Complexity measures for Turing machines, random access machines, Boolean circuits, Boolean logic, predicate calculus, basic concepts of automated theorem proving. Prerequisite: MCS 441.

**545. Advanced Complexity Theory. 4 Hours.** Basic concepts and results in complexity theory of particular interest for current research in theoretical computer science, especially complexity of probabilistic and parallel computations. Prerequisite: MCS 541.

**547. Theory of Parallel Computation. 4 Hours.** Math models for various types of parallel computers and VLSI-chips, design and analysis of parallel algorithms. Prerequisites: MCS 401 and 541.

**548. Mathematical Theory of Artificial Intelligence. 4 Hours.** Valiant's learning model, positive and negative results in learnability, automaton inference, perceptrons, Rosenblatt's theorem, convergence theorem, threshold circuits, inductive inference of programs, grammars and automata. Prerequisites: MCS 541.

**551. Generic Programming and the C++ Standard Template Library. 4 Hours.** Generic programming in C++. Templates, namespaces, smart pointers, reference counting. Algorithms, ranges, concepts and modeling. Iterators, function objects, adaptors, and containers. Algorithms and container classes in the STL. Extensive computer use required. Prerequisite: Grade of C or better in MCS 451 or in an equivalent course in C++.

**563. Analytic Symbolic Computation. 4 Hours.** Analytic computation, including integration algorithms, differential equations, perturbation theory, mixed symbolic-numeric algorithms and other related topics. Prerequisites: Grade of C or better in MCS 460 or the equivalent, and Math 480 or consent of the instructor.

**565. Mathematical Theory of Databases. 4 Hours.** Abstract systems for databases, syntax and semantics of operational languages, dependencies and normal forms, axiomizations, queries and query optimization, null values, algebraic interpretations. Prerequisite: Consent of the instructor.

**571. Numerical Methods for Partial Differential Equations. 4 Hours.** Finite difference methods for parabolic, elliptic and hyperbolic differential equations: explicit, Crank-Nicolson implicit, alternating directions implicit, Jacobi, Gauss-Seidel, successive over-relaxation, conjugate gradient, Lax-Wendroff, Fourier stability. Prerequisites: Math 481 and MCS 471 or consent of the instructor.

**572. Introduction to Supercomputing. 4 Hours.** Introduction to supercomputing on vector and parallel processors; architectural comparisons, parallel algorithms, vectorization techniques, parallelization techniques, actual implementation on real machines. Prerequisites: MCS 471 or 571, or consent of the instructor.

**575. Computer Performance Evaluation. 4 Hours.** Modeling of computer systems, basic queues, central server models, Little's Law, operational analysis, Markovian networks, Jackson and BCMP networks, product form solutions, computational algorithms, mean value analysis, approximation methods. Prerequisites: Stat 401 and MCS 412, or consent of instructor.

**590. Advanced Topics in Computer Science. 4 Hours.** Students may register for more than one section per term. Topics in areas such as: mathematical aspects of artificial intelligence, symbolic methods in mathematics, mathematical cryptography, automated reasoning. Topics may vary from term to term. Prerequisite: Approval of the department.

**591. Advanced Topics in Combinatorial Theory. 4 Hours.** May be repeated for credit. Some of the following topics: combinatorial enumeration, designs, graph theory, matroid theory, combinatorial matrix theory, Ramsey theory. Contents vary from year to year. Prerequisites: MCS 423.

**592. Advanced Topics in Error-Correcting Codes. 4 Hours.** Topics of current interest in coding theory including codes which are of practical value and which shed light on various mathematical areas. Prerequisites: MCS 531, or consent of instructor.

**593. Graduate Student Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.

**595. Graduate Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Prerequisite: Approval of the department.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course sponsored by a faculty member. Prerequisites: Approval of the instructor and the department.

**597. MSl Master's Project. 2 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. S/U grade only. Specialized project under close faculty supervision to satisfy the project requirement for the MS degree in Mathematics and Information Science for Industry. Prerequisites: MCS 504 and approval of the department.

**598. Master's Thesis. 0 to 16 Hours.** S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master's thesis. Prerequisites: Approval of the department.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Prerequisite: Approval of the department.

## Mathematics (Math)

**410. Advanced Calculus I. 4 Hours.** Functions of several variables, differentials, theorems of partial differentiation. Calculus of vector fields, line and surface integrals, conservative fields, Stokes's and divergence theorems. Cartesian tensors. Prerequisite: Grade of C or better in Math 210.

**411. Advanced Calculus II. 4 Hours.** Implicit and inverse function theorems, transformations, Jacobians. Point-set theory. Sequences, infinite series, convergence tests, uniform convergence. Improper integrals, gamma and beta functions, Laplace transform. Prerequisite: Grade of C or better in Math 410.

**413. Analysis I. 4 Hours.** The real number system, continuous functions, differentiability, the Riemann integral. Prerequisite: Grade of C or better in Math 215 or consent of the instructor.

**414. Analysis II. 4 Hours.** Sequences and series of functions. Uniform convergence. Taylor's theorem. Real valued functions of several variables, curves and vector fields, line and surface integrals. Prerequisite: Grade of C or better in Math 413.

**417. Complex Analysis with Applications. 4 Hours.** Complex numbers, analytic functions, complex integration, Taylor and Laurent series, residue calculus, branch cuts, conformal mapping, argument principle, Rouché's theorem, Poisson integral formula, analytic continuation. Prerequisite: Grade of C or better in Math 210.

**419. Models in Applied Mathematics. 4 Hours.** Introduction to mathematical modeling; scaling, graphical methods, optimization, computer simulation, stability, differential equation models, elementary numerical methods, applications in biology, chemistry, engineering and physics. Prerequisites: Grade of C or better in Math 220 and in MCS 260.

**421. Modern Partial Differential Equations. 4 Hours.** Partial differential equations from a modern viewpoint. Hilbert and Banach spaces. Existence and uniqueness theorems. Compactness theorems. Initial value problems, boundary value problems. Sobolev Spaces. Differential operators on manifolds. Prerequisite: Grade of C or better in Math 480.

**425. Linear Algebra II. 4 Hours.** Canonical forms of a linear transformation, inner product spaces, spectral theorem, principal axis theorem, quadratic forms, special topics such as linear programming. Prerequisite: Grade of C or better in Math 320.

**427. Analysis in Several Variables. 4 Hours.** Properties of Cartesian n-space the derivative, inverse and implicit function theorems, extrema, line integrals, vector calculus theorems, change of variables, differential forms, generalized Stokes's theorem. Prerequisites: Grade of C or better in Math 320, and one course from Math 410, 411, 413, 414.

**430. Formal Logic I. 4 Hours.** Credit is not given for both Mathematics 430 and Philosophy 416. First order logic, syntax and semantics, completeness-incompleteness. Prerequisite: Grade of C or better in MCS 261 or Math 320 or EECS 360.

**435. Foundations of Number Theory. 4 Hours.** Primes, divisibility, congruences, Chinese remainder theorem, primitive roots, quadratic residues, quadratic reciprocity, and Jacobi symbols. The Euclidean algorithm and strategies of computer programming. Prerequisite: Grade of C or better in Math 210.

**436. Number Theory for Applications. 4 Hours.** Primality testing methods of Lehmer, Rumely, Cohen-Lenstra, Atkin. Factorization methods of Gauss, Pollard, Shanks, Lenstra, and quadratic sieve. Computer algorithms involving libraries and nested subroutines. Prerequisite: Grade of C or better in Math 435.

**440. Introduction to Higher Geometry. 4 Hours.** Projective geometry, as an extension of Euclidean geometry, treated synthetically and/or algebraically. Desargues's and Pappus's theorems, subgeometries, conics, and the underlying skew field. Prerequisites: Grade of C or better in Math 425 and 330.

**442. Differential Geometry of Curves and Surfaces. 4 Hours.** Frenet formulas, isoperimetric inequality, local theory of surfaces, Gaussian and mean curvature, geodesics, parallelism, and the Gauss-Bonnet theorem. Prerequisites: Grade of C or better in either Math 410 or 427; and Math 320.

**445. Introduction to Topology I. 4 Hours.** Elements of metric spaces and topological spaces including product and quotient spaces, compactness, connectedness, and completeness. Examples from Euclidean space and function spaces. Prerequisites: Grade of C or better in Math 410 or 411 or 413.

**446. Introduction to Topology II. 4 Hours.** Topics in topology chosen from the following: advanced point set topology, piecewise linear topology, fundamental group and knots, differential topology, applications to physics and biology. Prerequisite: Grade of C or better in Math 445.

**480. Applied Differential Equations. 4 Hours.** Linear first-order systems. Numerical methods. Nonlinear differential equations and



stability. Introduction to partial differential equations. Sturm-Liouville theory. Boundary value problems and Green's functions. Prerequisite: Grade of C or better in Math 220.

**481. Applied Partial Differential Equations. 4 Hours.**

Initial value and boundary value problems for second order linear equations. Eigenfunction expansions and Sturm-Liouville theory. Green's functions. Fourier transform. Characteristics. Laplace transform. Prerequisite: Grade of C or better in Math 220.

**484. Tensor Analysis. 4 Hours.** Cartesian tensors, orthogonal transformations. General tensor calculus, Riemannian space, covariant differentiation, Christoffel symbols, curvature tensor, differential geometry. Emphasis on aspects of interest in science and engineering. Prerequisite: Grade of C or better in Math 310 or 320 or 410.

**494. Special Topics in Mathematics. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisite: Approval of the department.

**496. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of instructor and the department.

**500. Recursion Theory I. 4 Hours.** Same as Phil 560. Primitive recursion, recursive and recursively enumerable sets, the arithmetic hierarchy, Post's problem and the finite injury priority method. Prerequisite: MCS 441.

**502. Metamathematics I. 4 Hours.** Same as Phil 562. First order logic, completeness theorem and model theory. Prerequisite: Math 430 or consent of the instructor.

**503. Metamathematics II. 4 Hours.** Same as Phil 563. Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. Prerequisite: Math 502.

**504. Set Theory I. 4 Hours.** Same as Phil 565. Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. Prerequisite: Math 430 or 502.

**506. Model Theory I. 4 Hours.** Same as Phil 567. Introduction to stability theory: categoricity, stability, forking, finite equivalence relation theorem, indiscernibles, orthogonality. Prerequisite: Math 502.

**507. Model Theory II. 4 Hours.** Same as Phil 568. Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. Prerequisite: Math 506.

**508. Lattice Theory. 4 Hours.** Partially ordered sets and lattices, congruences, polynomials, free lattices. Distributive lattices, Boolean algebras, representation. Modular lattices, geometric lattices, the Arguesian law. Prerequisite: Math 330 or consent of the instructor.

**509. Universal Algebra I. 4 Hours.** Algebraic systems, homomorphisms, congruences, subalgebras, direct and subdirect products. Equational classes, free algebras, Birkhoff's theorem. Malcev conditions, congruence distributive equational classes. Prerequisites: Math 330 and 425.

**510. Universal Algebra II. 4 Hours.** Discriminator and directly representable varieties, ultraproducts and quasivarieties, finitely based equational theories, commutator and center. Prerequisite: Math 509.

**512. Advanced Topics in Logic. 4 Hours.** Same as Phil 569. Students may register for more than one section per term. Advanced topics in modern logic; e.g., descriptive set theory, model theory of fields, theory of hierarchies, stable groups. Prerequisite: Approval of the department.

**513. Advanced Topics in Universal Algebra and Lattice Theory. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Special topics. Prerequisites: Approval of the department.

**514. Number Theory I. 4 Hours.** Introduction to classical, algebraic, and analytic number theory. Euclid's algorithm, unique factorization, quadratic reciprocity, and Gauss sums, quadratic forms, real approximations, arithmetic functions, Diophantine equations.

**515. Number Theory II. 4 Hours.** Introduction to classical, algebraic, and analytic number theory. Algebraic number fields, units, ideals, and P-adic theory Riemann Zeta-function, Dirichlet's Theorem, Prime Number Theorem. Prerequisite: Math 514.

**516. Second Course in Abstract Algebra I. 4 Hours.** Structure of groups, Sylow theorems, solvable groups; structure of rings, polynomial rings, projective and injective modules, finitely generated modules over a PID. Prerequisites: Math 330 and 425.

**517. Second Course in Abstract Algebra II. 4 Hours.**

Rings and algebras, polynomials in several variables, power series rings, tensor products, field extensions, Galois theory, Wedderburn theorems. Prerequisite: Math 516.

**518. Representation Theory. 4 Hours.** Major areas of representation theory, including structure of group algebras, Wedderburn theorems, characters and orthogonality relations, idempotents and blocks. Prerequisites: Math 517.

**519. Algebraic Groups. 4 Hours.** Classical groups as examples; necessary results from algebraic geometry; structure and classification of semisimple algebraic groups. Prerequisite: Math 517.

**520. Homological Algebra. 4 Hours.** Modules, categories and functors, derived functors, the Kunnet formula, cohomology of groups, cohomology of algebras, spectral sequences and their applications, selected topics. Prerequisites: Math 516.

**530. Advanced Topics In Number Theory. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Subject may vary from semester to semester. Topics may include Elliptic functions, L-functions, modular forms. Prerequisite: Approval of the department.

**531. Advanced Topics In Algebra. 4 Hours.** Students may register for more than one section per term. Research-level topics such as groups and geometries, equivalencies of module categories, representations of Lie-type groups. Prerequisite: Approval of the department.

**532. Advanced Topics in Finite Groups. 4 Hours.** Students may register for more than one section per term. Major areas of finite group theory, including permutation and linear representations, classical and sporadic groups, local methods and classification results. Prerequisite: Math 517.

**533. Real Analysis I. 4 Hours.** Introduction to real analysis. Lebesgue measure and integration, differentiation, L-p classes, abstract integration. Prerequisite: Math 411 or 414 or the equivalent.

**534. Real Analysis II. 4 Hours.** A continuation of Math 533. Prerequisite: Math 417.

**535. Complex Analysis I. 4 Hours.** Analytic functions as mappings. Cauchy theory. Power Series. Partial fractions. Infinite products. Prerequisite: MATH 411 or 427.

**536. Complex Analysis II. 4 Hours.** Normal families, Riemann mapping theorem. Analytic continuation, harmonic and subharmonic functions, Picard theorem, selected topics. Prerequisite: Math 535.

**537. Introduction to Harmonic Analysis I. 4 Hours.** Fourier transform on  $L(p)$  spaces, Wiener's Tauberian theorem, Hilbert transform, Paley Wiener theory. Prerequisites: Math 533 and either Math 535 or Math 417.

**538. Introduction to Harmonic Analysis II. 4 Hours.** An introduction to the theory of singular integrals, and  $H(p)$  spaces. Prerequisite: Math 537 or consent of the instructor.

**539. Functional Analysis I. 4 Hours.** Topological vector spaces, Hilbert spaces, Hahn-Banach theorem, open mapping, uniform boundedness principle, linear operators in a Banach space, compact operators. Prerequisite: Math 533.

**540. Functional Analysis II. 4 Hours.** Spectral theorem for compact Hermitian operators on a Hilbert space. Spectral theorem for normal operators on a Hilbert space. Unbounded operators. Semigroups of linear operators. Ergodic theory. Prerequisite: Math 539.

**541. Partial Differential Equations I. 4 Hours.** Theory of distributions; fundamental solutions of the heat equation, wave equation, and Laplace equation. Harmonic functions. Cauchy problem for the wave equation. Prerequisite: Math 417.

**542. Partial Differential Equations II. 4 Hours.** Cauchy problem for hyperbolic equations. Propagation of singularities. Boundary value problems for elliptic equations. Prerequisite: Math 541.

**546. Advanced Topics In Analysis. 4 Hours.** Students may register for more than one section per term. Subject may vary from semester to semester. Topics include partial differential equations, several complex variables, harmonic analysis and ergodic theory. Prerequisite: Approval of the department.

**547. Algebraic Topology I. 4 Hours.** The fundamental group and its applications, covering spaces, classification of compact surfaces, introduction to homology, development of singular homology theory, applications of homology. Prerequisites: Math 330 and 445.



**548. Algebraic Topology II. 4 Hours.** Cohomology theory, universal coefficient theorems, cohomology products and their applications, orientation and duality for manifolds, homotopy groups and fibrations, the Hurewicz theorem, selected topics. Prerequisite: Math 547.

**549. Differentiable Manifolds I. 4 Hours.** Smooth manifolds and maps, tangent and normal bundles, Sard's theorem and transversality, embedding, differential forms, Stokes's theorem, degree theory, vector fields. Prerequisite: Math 445.

**550. Differentiable Manifolds II. 4 Hours.** Vector bundles and classifying spaces, Lie groups and Lie algebras, tensors, Hodge theory, Poincaré duality. Topics from elliptic operators, Morse theory, cobordism theory, deRham theory, characteristic classes. Prerequisite: Math 549.

**551. Riemannian Geometry. 4 Hours.** Riemannian metrics and Levi-Civita connections, geodesics and completeness, curvature, first and second variation of arc length, comparison theorems. Prerequisites: Math 442 and 549.

**552. Algebraic Geometry I. 4 Hours.** Basic commutative algebra, affine and projective varieties, regular and rational maps, function fields, dimension and smoothness, projective curves, schemes, sheaves, and cohomology, positive characteristic.

**553. Algebraic Geometry II. 4 Hours.** Divisors and Linear systems, differentials, Riemann-Roch theorem for curves, elliptic curves, geometry of curves and surfaces. Prerequisite: Math 552.

**554. Complex Manifolds I. 4 Hours.** Holomorphic functions in several variables, Riemann surfaces, Sheaf theory, vector bundles, Stein manifolds, Cartan theorem A and B, Grauert direct image theorem. Prerequisites: Math 517 and 535.

**555. Complex Manifolds II. 4 Hours.** Dolbeault Cohomology, Serre duality, Hodge theory, Kodaira vanishing and embedding theorem, Lefschetz theorem, Complex Tori, Kähler manifolds. Prerequisites: Math 517 and 535.

**568. Topics In Algebraic Topology. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Homotopy groups and fibrations. The Serre spectral sequence and its applications. Classifying spaces of classical groups. Characteristic classes of vector bundles. Prerequisite: Math 548 or consent of the instructor.

**569. Advanced Topics In Geometric and Differential Topology. 4 Hours.** Topics from areas such as index theory, Lefschetz theory, cyclic theory, KK theory, non-commutative geometry, 3-manifold topology, hyperbolic manifolds, geometric group theory, and knot theory. Prerequisite: Approval of the department.

**570. Advanced Topics In Differential Geometry. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Subject may vary from semester to semester. Topics may include eigenvalues in Riemannian geometry, curvature and homology, partial differential relations, harmonic mappings between Riemannian manifolds, hyperbolic geometry, arrangement of hyperplanes. Prerequisite: Approval of the department.

**571. Advanced Topics In Algebraic Geometry. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Various topics such as algebraic curves, surfaces, higher dimensional geometry, singularities theory, moduli problems, vector bundles, intersection theory, arithmetical algebraic geometry, and topologies of algebraic varieties. Prerequisite: Approval of the department.

**572. Advanced Topics In Geometric Analysis. 4 Hours.** Topics drawn from areas such as potential theory, Schauder estimates, maximum principles, Dirichlet problem, quasilinear elliptic equations. Prerequisite: Approval of the department.

**573. Methods of Applied Mathematics. 4 Hours.** Applications of applied mathematics, integral equations, eigenfunction expansions, calculus of variations, fluid flow and conformal mapping, special functions, Laplace, Mellin, and Hankel transforms, approximations. Prerequisite: Math 417 and 481, or consent of the instructor.

**574. Applied Optimal Control. 4 Hours.** Introduction to optimal control theory; calculus of variations, maximum principle, dynamic programming, feedback control, linear systems with quadratic criteria, singular control, optimal filtering, stochastic control. Prerequisite: Math 411 or 427, or consent of the instructor.

**575. Integral Equations and Applications. 4 Hours.** Fredholm and Volterra equations, Fredholm determinants, separable and symmetric kernels, Neumann series, transform methods, Wiener-Hopf method, Cauchy kernels, nonlinear equations, perturbation methods. Prerequisite: Math 411 and 417 and 481, or consent of the instructor.

**576. Boundary Value Problems. 4 Hours.** Distributions, Green's functions, alternative theorem, regular and singular Sturm-Liouville problems, spectral theory, potential theory, method of images, complex variable methods, equations of evolution. Prerequisites: Math 320 and 417 and 481, or consent of the instructor.

**577. Advanced Applied Partial Differential Equations. 4 Hours.** Quasilinear and nonlinear first order PDE's, shock solutions, second order equations, cylinder and sphere problems, Wave, Laplace and diffusion equations, maximum principles, nonlinear wave motion. Prerequisites: Math 410 and 417 and 481.

**578. Asymptotic Methods. 4 Hours.** Asymptotic series, Laplace's method, stationary phase, steepest descent method, Stokes phenomena, uniform expansions, multi-dimensional Laplace integrals, Euler-MacLaurin formula, irregular singular points, WKBJ method. Prerequisites: Math 417 and 481, or consent of the instructor.

**579. Singular Perturbations. 4 Hours.** Algebraic and transcendental equations, regular perturbation expansions of differential equations, matched asymptotic expansions, boundary layer theory, Poincaré-Lindstedt, multiple scales, bifurcation theory, homogenization. Prerequisite: Math 481 or consent of the instructor.

**580. Mathematics of Fluid Mechanics. 4 Hours.** Development of concepts and techniques used in mathematical models of fluid motions. Euler and Navier Stokes equations. Vorticity and vortex motion. Waves and instabilities. Viscous fluids and boundary layers. Asymptotic methods. Prerequisites: Grade of C or better in Math 410 and Grade of C or better in Math 417 and Grade of C or better in Math 481.

**581. Physical Principles of Applied Mathematics II. 4 Hours.** Development of concepts and techniques basic to key mathematical models of physical phenomena; dynamic problems in elasticity, fluids, nonlinear wave propagation, group speed and velocity. Prerequisite: Math 580.

**582. Wave Propagation and Scattering I. 4 Hours.** Solutions of wave equations in multiple dimensions, vector, and dyadic waves; separable and nonseparable problems. Representations: Green's function integrals, complex integrals, spectral representations. Approximate solutions. Prerequisites: Math 417 and 481; or consent of the instructor.

**583. Wave Propagation and Scattering II. 4 Hours.** Solutions of reduced wave equations for scattering of scalar, vector, and dyadic waves; separable and nonseparable problems. Representations: Green's function integrals, complex integrals. Various approximations. Prerequisite: Math 582.

**584. Applied Stochastic Models. 4 Hours.** Applications of stochastic models in chemistry, physics, biology, queueing, filtering, and stochastic control, diffusion approximations, Brownian motion, stochastic calculus, stochastically perturbed dynamical systems, first passage times. Prerequisite: Stat 401 and Math 417 and 481, or consent of the instructor.

**585. Applied Deterministic Models. 4 Hours.** Applications of deterministic models in biology, chemistry, economics, mechanics and physics. Topics include population dynamics, chemical kinetics, resource optimization, mechanical vibrations and traffic flow. Prerequisite: Math 481 or consent of the instructor.

**586. Computational Finance. 4 Hours.** Introduction to the mathematics of financial derivatives; options, asset price random walks, Black-Scholes model; partial differential techniques for option valuation, binomial models, numerical methods; exotic options, interest-rate derivatives. Prerequisites: Grade of C or better in Math 220 and Grade of C or better in Stat 381; or consent of the instructor.

**589. Teaching and Presentation of Mathematics. 2 Hours.** No graduation credit awarded for students enrolled in the Master of Science in the Teaching of Mathematics degree program. Required for teaching assistants in MSCS. Strategies and techniques for effective teaching in college and for mathematical consulting. Observation and evaluation, classroom management, presenting mathematics in multidisciplinary research teams.

**590. Advanced Topics in Applied Mathematics. 4 Hours.** Topics from areas such as: elastic scattering, nonlinear

problems in chemistry and physics, mathematical biology, stochastic optimal control, geophysical fluid dynamics, stability theory, queueing theory. Prerequisite: Approval of the department.

**591. Seminar on Mathematics Curricula. 4 Hours.**

Examination of research and reports on mathematics curricula. Analysis of research in teaching and learning mathematics. Developments in using technology in mathematics teaching. Prerequisite: Enrollment in Doctor of Arts program in mathematics or consent of the instructor.

**592. Seminar on Mathematics: Philosophy and Methodology. 4 Hours.** Problems related to teaching and learning mathematics. Analysis of work of Piaget, Gagne, Bruner, Ausabel, Freudenthal, and others and their relation to mathematics teaching. Prerequisite: Enrollment in Doctor of Arts program in mathematics, or consent of the instructor.

**593. Graduate Student Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in a learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.

**594. Internship in Mathematics. 0 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. S/U grade only. Only 4 credit hours count toward the 32 credit hours required for the MS in MEd degree. Does not count toward the 12 credit hours of 500-level courses requirement. Under the direction of a faculty adviser, students work in government or industry on problems related to their major field of interest. At the end of internship, the student must present a seminar on the internship experiences. Prerequisites: Completion of the core courses in the degree program in which the student is enrolled and approval of the internship program by the graduate adviser and the Graduate Studies Committee.

**595. Research Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Prerequisite: Approval of the department.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.

**598. Master's Thesis. 0 to 16 Hours.** S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master's thesis. Prerequisite: Approval of the department.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Prerequisite: Approval of the department.

## Mathematics Teaching (MthT)

**400. Methods of Teaching Secondary Mathematics I. 4 Hours.** To be taken in the year prior to student teaching. Philosophies, issues, techniques, and styles of teaching high school mathematics. Implications of psychological models. Mathematics in the evolving curriculum. Preparation of lessons. Prerequisite: Grade of C or better in MthT 410, good academic standing in the MS in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above.

**401. Methods of Teaching Secondary Mathematics II. 4 Hours.** To be taken in the year prior to student teaching. Philosophies, issues, techniques and styles of teaching high school mathematics. Preparation of diverse lessons. Supervised teaching experience. Prerequisite: Grade of C or better in Math 210, and enrollment in the MS in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above.

**410. Advanced Euclidean Geometry I. 4 Hours.** A transformational approach to the geometry of the Euclidean plane is developed through the use of specific activities. Prerequisite: Grade of C or better in Math 210.

**411. Advanced Euclidean Geometry II. 4 Hours.** Axioms for Euclidean geometry are developed based upon reflections. Further concepts in Euclidean geometry which arise from these axioms are explored. Prerequisite: Grade of C or better MthT 410.

**420. Methods of Structured Programming I. 4 Hours.**

Structured programming teaching aids such as Karel the Robot and ELAN0, data types, control structures, procedures, functions, efficiency of algorithms, arrays and recursion. Prerequisite: Grade of C or better in Math 210.

**430. Mathematical Analysis for Teachers I. 4 Hours.**

Basic properties of numbers, functions, graphs, limits, continuity, completeness of the system of real numbers. Prerequisites: Grade of C or better in Math 210, or consent of the instructor.

**435. Abstract Algebra. 4 Hours.** For students in the Master of Science in the Teaching of Mathematics program only. Other students enroll in Math 330. Sets, properties of integers, groups, rings, fields. Prerequisites: A grade of C or better in Math 210, and enrollment in the MS in the Teaching of Mathematics program.

**438. Educational Practice with Seminar I. 6 Hours.**

Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: 2.50 grade point average in mathematics courses at the level of calculus or above, successful completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**439. Educational Practice with Seminar II. 6 Hours.**

Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Credit or concurrent registration in MthT 438, and approval of the department, and a 2.50 grade point average in mathematics courses at the level of calculus or above, and successful completion of 100 clock hours of pre-student-teaching field experiences.

**450. Concepts in Elementary School Mathematics I. 4 Hours.**

For elementary school teachers. Advanced analysis of concept development and teaching methods. Sorting, classifying, counting, number tracks, addition, subtraction, group, place value, length, area, and alternative teaching strategies. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**460. Geometric Measurement and Numerical Methods. 4 Hours.**

Do not purchase a calculator for the course until after the first day of class. Classical problems of length, area, and volume, including numerical trigonometry, are explored using a scientific calculator. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**465. Teaching Algebra for Understanding. 4 Hours.**

Manipulatives and other representations of mathematical concepts used for teaching algebra to middle grade students. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**466. Introduction to Calculus and the Graphing Calculator. 4 Hours.**

Problem solving using derivatives, differentials, and their applications followed by integrals and their applications. Maximum-minimum problems solved directly by graphing, then by derivatives. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

**467. Introduction to Number Theory with Application. 4 Hours.**

Classical topics of elementary number theory and how they pertain to teaching the upper grades. Primes, GCF, LCM, divisibility, floor and ceiling functions, Gaussian Residue, lattices. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

**468. Geometry with Applications for Middle Grade Teachers. 4 Hours.**

Plane and solid figures and their properties. Polygons and polyhedra. Euler's formula. Volume versus surface area. Spatial visualization; two-dimensional representations of three-dimensional figures. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

**470. Teaching Mathematics with Science: An Activity Approach I. 4 Hours.**

For elementary school teachers. Introduction to basic variables (length, area, volume, mass, time) and the Scientific Method (picture, table, graph, questions). Extensive use of TIMS project curriculum. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**480. Microcomputers in Elementary School Mathematics I. 4 Hours.**

For elementary school teachers.

Introduction to microcomputers and their use in elementary school mathematics. Basic microcomputer functions, educational software programs, pedagogical and curricular implications, and implementation questions. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**490. Topics in Teaching Secondary Mathematics. 1 to 5 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

**491. Topics in Teaching Elementary/Junior High School Mathematics. 1 to 5 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

**496. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisite: Approval of the instructor and the department.

**510. Introduction to Higher Geometry. 4 Hours.** For graduate students in mathematics teacher education programs. Other students enroll in Math 440. Projective geometry, as an extension of Euclidean geometry, treated synthetically and/or algebraically. Desargues' and Pappus' theorems, subgeometries, conics and the underlying skew field. Prerequisites: Grade of C or better in Math 425 and 330.

**530. Mathematical Analysis for Teachers II. 4 Hours.** Derivatives, inverse functions, Riemann integral, trigonometric functions, logarithmic and exponential functions. Prerequisite: A grade of C or better in MthT 430, or consent of the instructor.

**550. Concepts in Elementary School Mathematics II. 4 Hours.** Directed numbers, addends, changing units, rounding, error and accuracy, units of measurement, decimal and common fractions, function machines, number lines, calculators, geometric shapes, descriptive statistics. For elementary school teachers. Prerequisite: MthT 450 or consent of the instructor.

**560. Introduction to Analytic Geometry and Calculus. 4 Hours.** For elementary school teachers. Do not purchase a calculator until after the first day of class. Programmable calculators used to investigate ideas and applications of analytic geometry, differential and integral calculus. Examples and ideas relevant to elementary mathematics and science curricula. Prerequisite: MthT 460 or consent of the instructor.

**565. Teaching Geometry: An Activity Approach. 4 Hours.** Informal geometry using manipulatives, elementary topological concepts, polygons, polyhedra, metric geometry, motion geometry, geometric constructions, spherical geometry, introduction to research on the learning of geometry. For elementary school teachers. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

**570. Teaching Mathematics with Science: An Activity Approach II. 4 Hours.** Continues MthT 470. Cartesian coordinates, nonlinear functions, more complex analytic techniques, work, laws of motion, energy, electricity, use of microcomputers in data manipulation and analysis. Extensive use of TIMS project curriculum. Prerequisite: MthT 470 or consent of the instructor.

**575. Principles of Probability and Statistics. 4 Hours.** For elementary school teachers. Probability, descriptive and inferential statistics, implications for teaching. Emphasis on collection and analysis of data, classroom activities and software. Prerequisite: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers), or consent of the department.

**580. Microcomputers in Elementary School Mathematics II. 4 Hours.** Continues MthT 480. For elementary school teachers. Microcomputer functions, graphics and problem-solving, evaluation of software, additional uses of computers as an instructional tool. Prerequisite: MthT 480.

**589. Practicum in Teaching Elementary School Mathematics. 4 Hours.** Culminating experience for students in the MS in the Teaching of Mathematics program (option for elementary school teachers). Major project is required. Supervised weekly seminars. Prerequisites: Admission to the MS in the Teaching of Mathematics program (option for elementary school teachers) and consent of the instructor.

**590. Topics in Teaching Secondary Mathematics. 1 to 5 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

**591. Topics in Teaching Elementary/Junior High School Mathematics. 1 to 5 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

**592. Topics in Advanced Mathematics for Teachers. 1 to 5 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. For students in the MS in the Teaching of Mathematics program. Prerequisites: May vary according to topic.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisite: Approval of the instructor and the department.

## Mechanical Engineering (ME)

**401. Applied Stress Analysis I. 4 Hours.** Complex bending and torsion, curved flexural members, energy methods in design, theories of failure. Prerequisite: CEMM 203.

**403. Introduction to Composite Material Design. 4 Hours.** Micromechanics and macromechanics of composites; strength theory; analysis, design, and manufacturing techniques. Engineering applications. Prerequisite: ME 401.

**408. Intermediate Vibration Theory. 4 Hours.** Free and forced vibrations of multi-degree of freedom linear systems. Lagrangian dynamics, matrix, approximate and numerical methods. Prerequisite: ME 308.

**409. Advanced Kinematics I. 4 Hours.** Kinematic synthesis of planar linkages. Higher-order, precision point and approximate synthesis. Unified treatment of position, function, and path-angle problems. Consideration of branching and rotatability. Prerequisite: ME 320.

**410. Automation and Robotics Applications. 4 Hours.** Basic pneumatic and hydraulic systems. Design of sequential control circuits and ladder diagrams. Robot kinematics and dynamics. Robot design. Trajectory planning. Applications and demonstrations. Prerequisite: ME 210.

**412. Dynamic Systems Analysis I. 4 Hours.** Same as IE 412. Classical control theory, concept of feedback, Laplace transform, transfer functions, control system characteristics, root locus, frequency response, compensator design. Prerequisite: ME 308.

**413. Dynamics of Mechanical Systems. 4 Hours.** Degrees of freedom, generalized coordinates, principle of virtual work. D'Alembert's Principle, Lagrange's Equation, Hamilton's Principle. Equations of motion and Newton-Euler equations for rigid bodies. Prerequisite: ME 320.

**414. Theory of Gearing and Applications. 4 Hours.** Classification of gear drives. Geometry of plane and spatial gears. Analysis and synthesis of gears with approximate meshing. Applications to spur, helical, worm and bevel gear drives. Prerequisite: ME 320.

**415. Propulsion Theory. 4 Hours.** Thermodynamics and fluid mechanics of air-breathing engines, performance of rockets; chemical and nuclear rockets. Prerequisite: ME 419 or the equivalent.

**416. Flight Dynamics: Stability and Control. 4 Hours.** Fundamentals of flight, aeroelastic phenomena, static and dynamic stability and control of aircraft, nonlinear behavior. Prerequisites: ME 308 and 318.

**417. Intermediate Fluid Mechanics. 4 Hours.** Development of conservation equations for the Newtonian-fluid; continuity, Navier-Stokes and energy equations. Some exact and approximate solutions of highly viscous, viscous and inviscid flows. Boundary layer flows, jets and wakes. Prerequisite: ME 318.

**418. Elements of Turbulent Flow and Mixing. 4 Hours.** Turbulent transport equations; statistical nature of turbulent transports; recent developments in turbulent mixing, free shear flows, wall shear flows, transition, numerical modeling of turbulent flows. Prerequisite: ME 318.

**419. Compressible Flow Theory. 4 Hours.** Conservation laws, one-dimensional flows. Normal and oblique shock waves, Prandtl-



Meyer expansion, flow over airfoils. Applications to nozzles, shock-tubes, wind-tunnels. Flow with friction and heat addition or loss. Prerequisite: ME 318.

**421. Intermediate Heat Transfer. 4 Hours.** Topics in conduction, convection and radiation with emphasis on exact solutions: extended surfaces, internal and external flows, surface radiation, combined modes of heat transfer and selected topics. Prerequisite: ME 321 or consent of the instructor.

**422. Heating, Ventilation, and Air-Conditioning. 4 Hours.** Refrigeration systems and heat-pump, mass transfer in humidification, solar heat transfer in buildings, heating and cooling loads, air-conditioning computer project. Prerequisite: ME 321.

**423. Heat Exchangers. 4 Hours.** Classification; heat transfer and pressure drop analysis, flow distribution, transient performance, surface selection and geometrical properties, codes and standards. Prerequisites: ME 321 and 211.

**425. Second Law Analysis in Energy Engineering. 4 Hours.** Fundamentals: lost available work. Entropy generation minimization, optimal thermal design of: heat transfer augmentation devices, thermal energy storage, cryogenics, heat exchangers, thermal insulations, solar collectors. Prerequisite: ME 321.

**426. Applied Combustion. 4 Hours.** Topics in combustion, providing both a theoretical and applied understanding of combustion processes as they relate to furnaces. Internal and external combustion engines; pollutant formation. Prerequisite: ME 325.

**427. Solar Engineering. 4 Hours.** Applications; solar geometry and intensities; applied heat transfer topics; flat plate and concentrating collectors; energy storage; analysis of heating and cooling systems. Prerequisite: ME 321 or consent of the instructor.

**428. Numerical Methods in Mechanical Engineering. 4 Hours.** Introduction to numerical solution methods for problems in mechanical engineering. Example problems include heat transfer, fluid mechanics, thermodynamics, mechanical vibrations, dynamics, stress analysis, and other related problems. Prerequisites: EECS 170.

**429. Internal Combustion Engines. 4 Hours.** Introduction to engine types, characteristics, and performance. Combustion processes in spark and compression ignition engines; combustion abnormalities. Analysis of intake, exhaust, and fuel systems. Prerequisite: ME 325.

**433. Non-Equilibrium Thermal Processes. 4 Hours.** Molecular engineering. Non-equilibrium statistical mechanics. Distribution functions. Molecular excitation and de-excitation. Ionization and dissociation. Laser engineering. Non-equilibrium chemical kinetics. Surface processes. Chemisorption and physisorption. Prerequisite: ME 325 or consent of the instructor.

**441. Optical Methods in Mechanical Engineering. 4 Hours.** Optical measurement techniques in solid mechanics and thermal-fluid engineering. Fundamentals of optics. Use of holography, interferometry, LDV, lasers, light scattering, diffraction, and other relevant techniques.

**447. Introduction to Computer-Aided Design. 4 Hours.** Conventional and computer-assisted methods in design. Geometry manipulation. Computer-aided modeling with curves, surfaces, and solids. Design with finite-element analysis. PRO/Engineer and PRO/Mechanica. Prerequisites: Math 220 and ME 250.

**450. Air Pollution Engineering. 4 Hours.** Same as ChE 450. Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion. Prerequisite: ME 321 or consent of the instructor.

**464. Virtual Automation. 4 Hours.** Same as IE 464. Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing; industrial robots and automated factory models within virtual environments. Prerequisites: IE 201; and EECS 170 or EECS 171 or CS 107.

**468. Virtual Manufacturing. 4 Hours.** Same as IE 468. Virtual reality applications in manufacturing systems design, manufacturing applications of networked virtual reality, virtual reality modeling of occupational safety engineering. Prerequisite: EECS 171 or consent of the instructor.

**494. Special Topics in Mechanical Engineering. 4 Hours.** May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

#### **501. Advanced Thermodynamics. 4 Hours.**

Thermodynamic laws of closed and open systems; exergy destruction; property relations, single phase systems, Gibbs-Duhem relations, multiphase systems, equilibrium; engineering applications. Prerequisite: ME 325.

**502. Applied Stress Analysis II. 4 Hours.** Concepts from theory of elasticity, stress-raisers such as notches and holes, mechanical behavior of materials including yielding and fractures, thick-walled cylinders and rotating disks, thermal stresses, and plastic behavior. Prerequisite: ME 401.

**504. Computer-Aided Analysis of Multibody Systems I. 4 Hours.** Kinematics, dynamics, analysis of flexible mechanisms. Constrained mechanical systems with flexible components. Numerical methods. Computer-aided analysis. Applications. Prerequisite: ME 413 or consent of the instructor.

**505. Computer-Aided Analysis of Multibody Systems II. 4 Hours.** Large scale deformable bodies. Finite element method. Constrained motion of interconnected rigid and deformable bodies. Coordinate reduction. Computational methods. Applications. Prerequisite: ME 504.

**509. Advanced Kinematics II. 4 Hours.** Spatial transformation and displacements. Design for body guidance; applications to function-generators. Analyses utilizing various operators for closure; dualization; branching, rotatability; differential kinematics; numerical solutions. Prerequisite: ME 409.

**510. Robotic Manipulators. 4 Hours.** Description of robotic manipulator; gripper trajectory execution; manipulator design, degree-of-freedom, mobility, workspace, special link positions; static and dynamic force transmission. Prerequisite: ME 409 or 410 or 413; or consent of the instructor.

**512. Automatic Control of Mechanical Systems. 4 Hours.** Modeling and analysis of mechanical systems. Performance specification and evaluation. Modern control system design and analysis techniques. Real-time computer control of engines, manufacturing processes, biomechanical systems. Prerequisite: ME 412 or consent of the instructor.

**513. Principles and Design of Mobile Robots. 4 Hours.** Introduction to mobile robots; analysis and design of gaits; leg and body design; energy efficiency, kinematics and dynamics of legged systems. Prerequisite: ME 320.

**514. Mechanics of Viscous Fluids. 4 Hours.** Fundamentals of fluid mechanics. Streamline and vorticity. Boundary layer analysis. Similarity solutions, integral methods, and other techniques for treating laminar and turbulent flows. Prerequisite: ME 417.

**516. Compressible Fluid Mechanics. 4 Hours.** Conservation equations for compressible inviscid flows, equations of state, surface of discontinuity, one-dimensional and two-dimensional subsonic and supersonic flows. Prandtl-Meyer expansions and shock phenomena. Theory of characteristics. Prerequisite: ME 419.

**518. Fundamentals of Turbulence. 4 Hours.** Mathematical description of turbulence field; kinematics of homogeneous turbulence; correlation and spectrum tensor, dynamic behavior of isotropic turbulence, universal equilibrium theory; nonisotropic turbulence. Prerequisites: ME 417 and 418.

**521. Heat Conduction. 4 Hours.** Analysis of heat transfer in solids including separation of variables, superpositions, Du Hamel's theorem, integral transforms, similarity transformations, and approximate methods. Prerequisite: ME 321 or consent of the instructor.

**522. Convective Heat Transfer. 4 Hours.** Conservation equations. Momentum heat and mass transfer in laminar and turbulent boundary layers. Internal and external flows and heat transfer. Heat transfer with phase change. Special topics in convective heat transfer. Prerequisite: ME 321 or consent of the instructor.

**524. Thermal Radiation. 4 Hours.** Fundamentals of radiative transfer; energy exchange between surfaces and in enclosures, radiative transfer in the presence of an attenuating medium; combined radiation, conduction, convection problems. Prerequisite: ME 421 or consent of the instructor.

**525. Boiling Heat Transfer and Two-Phase Flow. 4 Hours.** Homogeneous and separated two-phase flow models for pressure drop and heat transfer. Pool boiling, nucleation and bubble dynamics, stability, condensation and engineering application problems. Prerequisite: ME 421.



**528. Numerical Heat Transfer. 4 Hours.** Numerical methods for solving selective problems in heat transfer. Iterative methods with shooting; local nonsimilarity methods; perturbation methods; finite difference methods; grid generation. Applications include conduction, convection, and radiation problems. Prerequisite: ME 421 or consent of the instructor.

**529. Advanced Internal Combustion Engines. 4 Hours.** Fundamentals of internal combustion engines. Combustion in homogeneous charged and compression ignition engines. Emission formation. Effect of design and operating variables, control, and instrumentation. Prerequisite: ME 429 or 426.

**531. Thermophysics of Gas Flows. 4 Hours.** Kinetic theory of gases. Transport properties, quantum mechanical analysis of atomic and molecular structures, atomic scale collision phenomena, propagation, emission, and phenomena, propagation, emission, and absorption of radiation.

**533. Plasma Engineering. 4 Hours.** Plasma-assisted applications. Kinetic theory of non-equilibrium processes. Plasma dynamics. Elementary processes-collisions. Diffusion and transport. Chemical reactions and surface treatment. Particle and energy balance in plasmas. Prerequisite: ME 433 or consent of the instructor.

**535. Theory of Vibrations II. 4 Hours.** Same as CEMM 535. Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; floquet waves; nonlinear vibrations. Prerequisite: CEMM 435 or ME 408 or the equivalent.

**536. Chemically Reacting Flows. 4 Hours.** Same as ChE 536. Nonequilibrium states; chemical thermodynamics and kinetics. Multicomponent continuum equations for flow of nonequilibrium fluids. Inverted nonequilibrium flows. Boundary layer flows with surface and gas-phase reactions. Frozen and equilibrium criteria. Waves in relaxing media. Prerequisites: ME 516 and 514 or 522.

**542. Advanced Computational Methods for Product and Process Design. 4 Hours.** Same as IE 542. Deterministic and statistical methods for modeling and optimizing engineering systems, in the broad context of product design, manufacturing process development, and designing for life cycle issues. Prerequisite: Programming language experience.

**547. Advanced Concepts in Computer-Aided Engineering. 4 Hours.** Useful concepts in motion simulation of complex rigid multibody systems. Interactive computer solutions. Recursive formulation of kinematical and dynamical equations of open and constrained multibody systems. Prerequisites: ME 413 and 447.

**548. Advanced Computer-Aided Manufacturing. 4 Hours.** Analysis and design of computer-integrated systems for process planning, production planning and control of discrete part manufacturing activities. Prerequisite: ME 447.

**569. Advanced Virtual Manufacturing. 4 Hours.** Same as IE 569. Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. Prerequisite: Consent of the instructor.

**594. Current Topics in Mechanical Engineering. 4 Hours.** May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

**595. Seminar on Mechanical Engineering Research. 1 Hour.** S/U grade only. Advances in mechanical engineering research will be discussed in a seminar setting. Students will be expected to make presentations in various areas, as well as invited faculty members. Prerequisite: Graduate standing in mechanical engineering.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Individual study under close supervision of a faculty member. Prerequisite: Consent of the instructor.

**598. MS Thesis Research. 0 to 16 Hours.** S/U grade only. May be repeated for credit. Individual research in specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research on specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

## Medical-Surgical Nursing (NuMS)

**530. Nursing Management of Acutely Ill Patients I. 3 Hours.** Advanced practice in medical-surgical nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and management of adults with common health problems in acute care. Prerequisites: Credit or concurrent registration in NuSC 530, NuSC 531, and NuSC532.

**532. Nursing Management of Acutely Ill Patients II. 3 Hours.** Concentration on advanced medical-surgical nursing covering pathophysiology, etiologies, clinical evaluation and management of acutely ill adults. Prerequisites: NuMS 530 and concurrent registration in NuSC 533.

**533. Medical-Surgical Clinical Nurse Specialist Practicum I. 4 to 8 Hours.** May be repeated for credit. Practicum for clinical nurse specialists emphasizing clinical practice, education, research and consultation related to care of adults with common health problems in acute care. Prerequisite: NuMS 530.

**534. Acute Care Nurse Practitioner Practicum I. 6 to 8 Hours.** May be repeated for credit. Practicum emphasizing the clinical evaluation, symptom management, education and case management of adults with common health problems in acute care. Prerequisite: Credit or concurrent registration in NuMS 530.

**535. Medical-Surgical Clinical Nurse Specialist Practicum II. 4 to 8 Hours.** May be repeated for credit. Practicum for clinical nurse specialists emphasizing clinical practice, education, research and consultation related to the care of adults with acute conditions. Prerequisite: NuMS 533.

**536. Acute Care Nurse Practitioner Practicum II. 6 to 8 Hours.** May be repeated for credit. Practicum emphasizing the clinical evaluation, symptom management, education and case management of acutely ill adults. Prerequisite: Credit or concurrent registration in NuMS 532 and NuMS 534.

**538. Acute Care Nurse Practitioner Practicum III. 6 to 8 Hours.** May be repeated for credit. Practicum emphasizing the comprehensive clinical evaluation and management of adults with complex health problems in acute care. Prerequisite: NuMS 536.

**542. Analysis of Medical-Surgical Nursing Research. 2 Hours.** Analysis of selected historical and contemporary examples of research in Medical-Surgical Nursing. Future directions for research and practice are examined. Prerequisite: Consent of the instructor.

**545. Biometrics and Applied Statistics. 4 Hours.** Application of recent procedures in statistical analysis. Emphasis is on design of experiments and regression analysis; use of BMDP software on Mainframe/VAX computers. Prerequisite: NuSC 545 or the equivalent or consent of the instructor.

**546. Multivariate Analysis for Health Sciences. 3 Hours.** Practical applications of multivariate techniques in health sciences. Minimal involvement in mathematics provided one has basic understanding of multivariate analysis. Prerequisite: NuMS 545.

**549. Laboratory Techniques for Nursing Research. 3 Hours.** Animals used in instruction. Techniques in laboratory research for nursing science. Basic physiological and biochemical methods and equipment, animal models, human subjects, safe laboratory practice, development from conceptualization through execution. Prerequisite: NuSC 530.

**550. Common Geriatric Health Problems. 3 Hours.** Advanced practice in geriatric nursing. Emphasizes pathophysiology etiologies, clinical evaluation and management of common and uncomplicated problems for older adults. Prerequisites: NuSC 530, 531, and 532.

**552. Management of Complex Geriatric Health Problems. 3 Hours.** Advanced practice in geriatric nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and management of complex health problems in older adults. Prerequisite: Credit or concurrent registration in NuMS 553 or 554.

**553. Geriatric Clinical Nurse Specialist Practicum I. 7 Hours.** Practicum emphasizing clinical practice, education, research and consultation related to care of older adults with common health problems. Prerequisite: NuMS 550.

**554. GNP Practicum I: Management of Common Health Problems. 6 Hours.** Practicum emphasizing clinical evaluation, health promotion, differential diagnosis, symptom management, education and case management of older adults with common uncomplicated health problems. Prerequisite: NuMS 550.

**555. Geriatric Clinical Nurse Specialist Practicum II. 8 Hours.** Practicum emphasizing clinical practice, education, research and consultation related to the care of older adults with acute and chronic conditions. Prerequisites: NuMS 552 and 553.

**556. GNP Practicum II: Older Adults with Complex Health Problems. 6 Hours.** Practicum emphasizing clinical evaluation, differential diagnosis, symptom management, education and case management of older adults with complex health problems. Prerequisite: NuMS 554.

**558. GNP Practicum III: Integrative Practice. 6 Hours.** Practicum emphasizing clinical evaluation, health promotion, differential diagnosis and comprehensive case management of older adults with common and complicated health problems. Prerequisite: NuMS 556.

**562. Quality of Life Issues in Research and Clinical Practice. 3 Hours.** Quality of life: construct definition, ethical issues in clinical practice of nurses and other health professionals, measurement and research regarding various illness and age groups. Prerequisite: Consent of the instructor.

**564. Pain: Etiology, Assessment, Management. 2 Hours.** The causes of pain and the variety of instruments used to assess and measure pain management in relation to chronic and acute pain. Prerequisite: Consent of the instructor.

### Medical Education (MHPE)

**421. Instructional Methods for Health Professionals. 3 Hours.** Improves skill in methods such as lecture, discussion, laboratory, supervision and use of media through practice, being videotaped, role playing and reading.

**431. Research Design & Grant Writing for Educational Research Projects. 2 Hours.** Introduction to the skills necessary to plan a research project and write a research grant proposal in an area of health professions education using a systematic approach. Prerequisite: Consent of the instructor.

**433. Principles of Evidence-Based Health Care. 2 Hours.** Same as BHIS 433. Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, comparing scientific papers as bases for health care education and practice. Prerequisite: Graduate or professional standing; and approval of the Department.

**439. Writing for Scientific Publication. 2 Hours.** Instruction and workshop explores the process of fully preparing and submitting a manuscript to a health professions journal. Students must bring analyzed data set. Prerequisite: Consent of the instructor.

**441. Clinical Decision Making. 2 Hours.** Introduction to descriptive and normative theories of decision making; interpretation of diagnostic tests; measuring patient preferences; decision analysis and cost-effectiveness analysis; psychology of judgment and choice. Prerequisite: Consent of the instructor.

**494. Special Topics in Health Professions Education. 1 to 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Selected topics of current interest in health professions education. Prerequisite(s): Prerequisites may vary by section, depending on topic.

**501. Current Issues in Health Professions Education. 4 Hours.** Examines how historical, social, policy, and organizational factors influence education in the health professions. Prerequisite: Consent of the instructor.

**502. Instruction and Assessment for Health Professionals. 4 Hours.** Methods and issues of effective instruction and assessment in health professions education are presented, including how effective instruction and assessment support student learning and faculty decisions. Prerequisite: Consent of the instructor.

**503. Curriculum Planning and Program Evaluation for Health Professionals. 4 Hours.** Methods and issues in planning and evaluating educational programs in the health professions are presented, including how institutional and social forces affect planning and evaluation. Prerequisite: Approval of the department.

**504. Organization and Management of Health Professions Education Programs. 4 Hours.** Focuses on problems, issues, and practices of leadership in health professions education. Students analyze their approaches to solving educational management problems, review pertinent models for organizational development in academic settings, develop an awareness of personal leadership styles, and consider strategies for managing selected educational problems.

**596. Independent Study. 1 to 4 Hours.** Selected problems or issues in health professions education are investigated under the direction of a faculty member of the student's choice.

**597. Project Research. 0 to 6 Hours.** S/U grade only. Selected problems or issues in health professions education are investigated under the direction of a committee of the student's choice.

**598. Thesis Research. 0 to 16 Hours.** S/U grade only. Selected problems or issues in health professions education are investigated under the direction of a committee of the student's choice.

### Medical Humanities (MHum)

**415. Topics in Literature and Health Care. 2 Hours.** A selected topic (e.g., aging, disability, dying) will be explored through literature for the insights that treatment can offer, especially to health professionals. Prerequisite: Enrollment in professional school or college or completion of any two humanities courses.

**494. Special Topics in Medical Humanities. 1 to 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Presents special topics in selected aspects of medical humanities for health professionals. Prerequisite: Prerequisites may vary by section, depending upon topic.

**496. Independent Study. 1 to 4 Hours.** Students may arrange with any of the faculty to do independent study on some aspect of communication, history, literature, philosophy, or ethics as it relates to health care.

**500. Philosophical Issues in Research. 2 Hours.** Same as PmAd 500. An in-depth examination of foundational issues underlying research questions of ethics, design, conduct and evaluation pertaining to pharmaceutical preparations.

### Medical Laboratory Sciences (MLS)

**413. Independent Study. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Study of topics of limited scope using scientific problem-solving methods and appropriate resources. Prerequisite: Consent of the instructor.

**417. Clinical Experience I. 3 to 10 Hours.** May be repeated for credit with the approval of the Division. Supervised clinical laboratory experience at an affiliated institution in 1-3 clinical disciplines to develop psychomotor skills, clinical reasoning, and professional behaviors for entry level practice. Prerequisites: Completion of required MLS discipline courses and consent of the coordinator.

**418. Clinical Experience II. 3 to 10 Hours.** May be repeated for credit with the approval of the Division. Continuation of MLS 417. Supervised clinical laboratory experience at an affiliated institution in 1-3 clinical disciplines to develop psychomotor skills, clinical reasoning, and professional behaviors for entry level practice. Prerequisites: Completion of sequence of required MLS discipline courses and consent of the coordinator.

**442. Clinical Immunology. 2 Hours.** Histocompatibility, cell mediated immunity, antibody diversity; interactions and assessment of cellular immunity. Hypersensitivity mechanisms, allergy, immunodeficiency diseases, autoimmunity and transplantation. Prerequisite: MLS 361 or consent of the instructor.

**446. Current Issues in Clinical Laboratory Science. 2 Hours.** Laboratory personnel certification/licensure; government regulations; physician office testing/consulting; information systems; education/management issues; ethics; patient interactions; role of allied health professionals; career opportunities; future trends.

**447. Clinical Correlations for Clinical Laboratory Scientists. 3 Hours.** Case studies will assist entry-level clinical laboratory professionals to integrate discipline-specific knowledge from clinical chemistry, hematology, immunohematology, immunology, and clinical microbiology into a comprehensive concept of the patient. Prerequisite: Concurrent registration in MLS 417 or MLS 418 or the equivalent; or consent of the instructor.

**455. Medical Mycology, Parasitology, Virology. 3 Hours.** Introduction to medical mycology, parasitology, and virology, including clinical aspects of isolation, classification, physiology and replication; pathogenesis of non-procaryotic infectious agents. Prerequisites: MLS 350 and consent of the instructor.

**520. General Clinical Chemistry. 3 Hours.** Same as Path 520. Clinically significant lipids, enzymes, hormones, trace metals and

vitamins; acid-base and electrolyte balance; medical relevance; methods of analysis/automation; therapeutic drug monitoring and toxicology. Prerequisite: Consent of the instructor.

**527. Clinical Laboratory Method Evaluation. 3 Hours.** Same as Path 527. Development and comparison of clinical laboratory methods; also, statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. Prerequisite: Consent of the instructor.

**530. Hematology I. 3 Hours.** Structure and function of bone marrow, spleen, lymph nodes, biologic membranes, granulocytes, plasma cells, lymphocytes, monocytes/macrophages and erythrocytes; pathophysiology of selected blood cell defects. Prerequisites: Certification and consent of the instructor.

**532. Hemostasis. 2 Hours.** Platelet physiology, kinetics, and disorders; procoagulant physiology, fibrinolytic factors, and the coagulation process; hemorrhagic disorders associated with factor deficiencies and vascular insufficiency; hypercoagulation syndromes, clinical management of clotting disorders. Prerequisites: Basic knowledge of hemostasis, certification, and consent of the instructor.

**560. Blood Groups: Systems and Serology. 3 Hours.** Red cell immunology, genetics, membrane biochemistry; genetics and characteristics of human blood group systems; parentage testing; related clinical serology; forensics; recent biotechnology. Prerequisites: General knowledge of immunohematology and consent of the instructor.

**561. Clinical Immunohematology and Transfusion. 3 Hours.** Blood cell metabolism, blood collection and storage, transfusion practices, adverse effects of transfusion, HDN, parentage testing, regulations, standards, and compliance, computer applications, quality assurance. Prerequisites: MLS 560 and consent of the instructor.

**562. Principles and Methods in Immunohematology I. 3 to 4 Hours.** Clinical/blood center sessions performing all aspects of blood donor pheresis; serological processing; component preparation; transfusion infectious disease testing; pretransfusion testing. Prerequisites: Credit or concurrent registration in MLS 560 and consent of the instructor.

**563. Principles and Methods in Immunohematology II. 3 to 4 Hours.** Clinical/blood center sessions for resolution of complex allo/auto antibody transfusion problems; paternity testing; HLA/platelet antibody testing; apheresis techniques; bone marrow/stem cell processing. Prerequisite: MLS 562 and credit or concurrent registration in MLS 561 and consent of the instructor.

**564. Current Trends in Immunohematology. 1 Hour.** S/U grade only. May be repeated for a maximum of 2 hours of credit. Advanced studies of current trends; assigned topics in current literature read, evaluated and discussed. Prerequisites: General knowledge of immunohematology and consent of the instructor.

**580. Practicum in Medical Laboratory Sciences. 1 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Field experience under supervision of a professional expert in a medical laboratory sciences setting that is consistent with the student's focus of study and career goals. Prerequisite: Consent of the instructor.

**581. Forensic Analysis of Biological Evidence. 4 Hours.** Same as BpS 581 and CrJ 581. Forensic blood identification and typing; body fluid identification and typing; blood group, isoenzyme, serum protein typing; electrophoresis; isoelectric focusing; DNA typing; reporting results; expert testimony. Prerequisite: Consent of the director of graduate studies.

**584. Forensic Drug Analysis and Toxicology. 4 Hours.** Same as CrJ 584 and BpS 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media. Emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the director of graduate studies.

**594. Special Topics in Medical Laboratory Sciences. 1 to 3 Hours.** Students may register for more than one section per term. Current theories and methods in medical laboratory sciences. Seminar, literature search, directed study, and discussion format. Topic areas include clinical chemistry, clinical microbiology, clinical immunology, immunohematology, and hematology. Prerequisites: Consent of the instructor.

**595. Seminar in Medical Laboratory Sciences. 1 Hour.** S/U grade only. Topics of current interest in medical laboratory sciences. Includes discussions of current journal articles and important new developments in the clinical laboratory disciplines. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research.

**597. Project Research in Medical Laboratory Sciences. 0 to 5 Hours.** May be repeated for credit. S/U grade only. Independent investigation that engenders the responsibilities of professionals to contribute to their field. Students investigate a topic/problem in their field, write an article and deliver an oral presentation. Prerequisite: Consent of the instructor.

**598. Research in Medical Laboratory Sciences. 0 to 16 Hours.** Students may register for more than one section per term. S/U grade only. Independent research in one area of medical laboratory sciences directed by a faculty member. Prerequisite: Foundation courses in research methods (such as AHS 510) and statistics, or consent of the instructor.

## Medicinal Chemistry (MdCh)

**412. Pharmaceutical Applications of Genomics and Bioinformatics. 2 Hours.** Same as PmMP 412. Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. Prerequisite: Phar 332 or consent of the instructor.

**460. Organic Medicinal Chemistry I. 3 Hours.** Same as PmMP 460. Organic reactions are discussed in terms of their mechanisms and utility in the field of medicinal chemistry, particularly in the synthesis of medicinal agents. Prerequisite: One year of organic chemistry with laboratory.

**560. Organic Medicinal Chemistry I. 3 Hours.** Organic reactions are discussed in terms of their mechanisms and utility in the field of medicinal chemistry, particularly in the synthesis of medicinal agents. Prerequisites: One year of organic chemistry with laboratory.

**561. Principles of Medicinal Chemistry. 4 Hours.** Requires concurrent registration in MdCh 592. Concerns basic chemical and physical principles necessary for an understanding of drug action. These principles are applied in the design and discovery of medicinal agents. Prerequisites: One year each of undergraduate organic chemistry and biochemistry.

**562. Spectroscopy in Medicinal Chemistry. 3 Hours.** The fundamental principles used to determine structure and conformation in molecules, emphasizing spectroscopic methods useful in solving structural problems and in analyzing dynamic biological processes. Prerequisite: Consent of the instructor or one year of physical chemistry.

**564. Physical Medicinal Chemistry. 3 Hours.** Focuses on kinetics and thermodynamics in biological systems. Applications to drug action will be emphasized. Prerequisite: One year of physical chemistry.

**565. Experimental Techniques in Medicinal Chemistry. 3 Hours.** Animals used in instruction. Lectures and laboratories on the isolation and identification of xenobiotics from biological matrices, variables affecting the metabolism of xenobiotics, and other physical techniques used in the study of medicinal agents. Prerequisites: MdCh 561 and 562.

**571. Organic Medicinal Chemistry II. 3 Hours.** Heterocyclic chemistry foundation for bio-organic mechanisms of enzyme reactions. Enzymes involved in biosynthesis and metabolism, particularly those that are targets for drug action or involved in drug metabolism. Prerequisites: MdCh 460 and 561.

**572. Drug Design. 2 Hours.** Quantitative structure-activity relationships, computer graphics, molecular modeling and simulation, and chemometrics as applied to drug design and discovery. Prerequisite: MdCh 561.

**573. Principles of Stereochemistry. 1 Hour.** Principles of molecular structure and stereochemistry for medicinal and natural products chemists focusing on stereochemical structures rather than synthesis. Prerequisites: Credit or concurrent registration in MdCh 560 and one year of organic chemistry with lab; or consent of the instructor.

**592. Research Techniques in Medicinal Chemistry. 2 Hours.** May be repeated for a maximum of 6 hours of credit. S/U grade only. Provides an initial biweekly informal seminar series with program faculty presenting a discussion of the ongoing research in her/his laboratory. Lectures/discussions will occur for the first part of the semester and an intensive lab experience will be for the remainder of the semester. To be taken fall and spring semesters of the first year of graduate study.



**594. Special Topics in Medicinal Chemistry. 2 to 4 Hours.** May be repeated for a maximum of 4 hours of credit. An advanced course covering selected topics which may include new spectroscopic, theoretical, chemometric, and synthetic approaches to biomolecular structure and function. Prerequisites: MdCh 561 and 562 and one year of physical chemistry and one semester of biochemistry or consent of the instructor.

**595. Seminar in Medicinal Chemistry. 1 Hour.** S/U grade only. Presentation on a current research topic.

**598. Master's Research in Medicinal Chemistry. 0 to 16 Hours.** S/U grade only. Thesis research to fulfill master's degree requirements.

**599. Doctoral Research in Medicinal Chemistry. 0 to 16 Hours.** S/U grade only. Research for doctoral students.

## Medicinal Chemistry and Pharmacognosy (PmMP)

**412. Pharmaceutical Applications of Genomics and Bioinformatics. 2 Hours.** Same as MdCh 412. Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. Prerequisite: Phar 332 or consent of the instructor.

## Medicine (Med)

**500. Fundamentals of Sleep Medicine. 1 Hour.** Fundamentals of sleep anatomy, cell biology, physiology, and pharmacology, applied to clinical disorders of sleep which represent significant public health risks. Prerequisite: Consent of the instructor.

## Microbiology and Immunology (MIm)

**425. Fundamentals of Immunology and Microbiology. 3 Hours.** Mechanisms of host defense; antigens, immunoglobulins and their reactions; antibody synthesis, regulation and the cellular immune response; bacterial and viral structure and function; mechanisms of pathogenesis. Prerequisite: Consent of the instructor.

**426. Microorganisms as Agents of Human Disease. 3 Hours.** Fundamental aspects of bacterial, fungal and viral pathogenesis, therapy, control and prevention of infectious diseases. Prerequisite: Consent of the instructor.

**455. Microbiology Laboratory Rotation. 3 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. S/U grade only. Course in basic and applied methods essential for the study of nucleic acids, immunoglobulins, gene transfer, cell fusion, virological and immunological methods.

**501. Immunochemistry. 3 Hours.** Same as Bche 501. Immunoglobulin genetics and structure; regulation of immunoglobulin gene expression and generation of antibody diversity; molecular and genetic aspects of lymphocyte receptors and activation. Prerequisite: MIm 451 and Bche 460 and/or consent of the instructor.

**502. Immunobiology. 3 Hours.** Biology of immunocompetent cells and the immune response; mechanisms of cell-mediated injury and hypersensitivity; major histocompatibility complex, MHC antigens; tumor immunity. Prerequisites: MIm 455 and Bche 460 or consent of the instructor.

**503. Advanced Virology. 3 Hours.** Animal DNA, RNA and retroviruses; morphology; genome structure; replication; gene expression and its regulation; cellular transformation by viral ontogeneses; viral vectors and their applications. Prerequisites: MIm 553 and 455, or consent of the instructor.

**504. Medical Mycology. 3 Hours.** Lectures, conferences and laboratory work covering the saprophytic, opportunistic and pathogenic fungi causing disease in man. Prerequisite: Graduate standing or professional degree with consent of the instructor.

**513. Structure of Biopolymers. 3 Hours.** Same as Bche 513 and PmPg 513. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: Bche 460 and a year of physical chemistry; or consent of the instructor.

**531. Advanced Molecular Genetics. 2 Hours.** Eukaryotic cells in culture, cell hybridization and differentiation, gene mapping,

regulation; recombination models; mutation and fate of inserted DNA; gene rescue; ontogeneses. Prerequisites: MIm 455 and 554.

**534. Mechanism of Microbial Pathogenesis. 2 Hours.** Advanced course covering the variety of mechanisms by which microbes produce disease in a healthy or a compromised host. Bacterial, mycoplasmal, Rickettsial, viral, fungal, and protozoal diseases are included. Prerequisites: MIm 451, 552, and 553.

**551. Immunology. 5 Hours.** Concepts in immunochemistry, immunogenetics, molecular immunology, cellular immunology and immunopathology at the intermediate level. Prerequisites: An undergraduate course in molecular biology or genetics, consent of the instructor and concurrent registration in Bche 460 or the equivalent.

**552. Molecular Microbiology. 3 Hours.** Structure, growth, metabolism, bacterial phylogeny and the diversity of microorganisms, microbial genetics, molecular biology, genetic regulation. Plasmids, transposons, bacteriophages, mechanism of pathogenesis. Prerequisite: Credit or concurrent registration in Bche 460 or consent of the instructor.

**553. Molecular Biology of Cells and Viruses. 3 Hours.** Animal viruses including basic structure and viral nucleic acids; emphasizes molecular organization of viral genomes; cellular and molecular events during virus replication and viral transformation. Prerequisite: MIm 552 or consent of the instructor.

**554. Molecular Aspects of Microbiology. 3 Hours.** Basic concepts of prokaryotic and eukaryotic genetics; gene structure and function; gene expression; molecular aspects of mutation and recombination; chromosome structure and function. Prerequisite: Bche 460.

**560. Molecular Microbiology. 5 Hours.** Credit is not given for MIm 560 if the student has credit in MIm 552. Genetics, molecular biology and physiology of bacteria, viruses, and Eukaryotic cells. Special emphasis on genetic regulation. Prerequisite: Concurrent registration in Bche 460.

**561. Eukaryotic Molecular Biology and Immunology. 5 Hours.** Credit is not given for MIm 561 if the student has credit in MIm 451 and/or 553. Genetics, molecular biology and physiology of eukaryotic cells. Concentrated focus on molecular and cellular immunology, lymphocyte biology and immunochemistry. Prerequisite: Bche 460.

**585. Cell Biology. 4 Hours.** Same as Anat 585 and PhyB 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

**594. Special Topics in Microbiology, Immunology, and Virology. 1 to 2 Hours.** Advanced topics are covered in depth. Topics vary yearly. Prerequisites: MIm 451, 552, 553, and 455, Bche 460, and consent of the instructor.

**595. Seminar in Microbiology and Immunology. 1 Hour.** S/U grade only. Topics of current research interest are presented by guest lecturers from outside institutions in areas of molecular biology, bacteriology, virology and immunology.

**598. Research in Molecular Biology and Immunology. 0 to 16 Hours.** S/U grade only. MS thesis research on problems in microbiology, immunology, virology and molecular biology. Prerequisite: Graduate standing in Microbiology and Immunology.

**599. Research in Molecular Biology and Immunology. 0 to 16 Hours.** S/U grade only. PhD thesis research on problems in microbiology, immunology, virology and molecular biology. Prerequisite: Graduate standing in Microbiology and Immunology.

## Molecular Genetics (Gene)

**501. Faculty Research Seminars. 1 Hour.** S/U grade only. Should be taken in the first year in the PhD in Molecular Genetics program. Faculty presentation of research areas within molecular genetics. Prerequisite: Graduate standing in the PhD in Molecular Genetics program or consent of the instructor.

**502. Somatic Cell and Human Genetics. 4 Hours.** The genetics of somatic cells and advanced human genetics. Gene transfer, mutagenesis, drosophila genetics, genetic linkage and human disease, cancer genetics, and gene therapy. Prerequisite: Bche 460 or consent of the instructor.

**503. Research Methods in Genetics. 5 Hours.** May be repeated for a maximum of 10 hours of credit. Open only to students in the Molecular Genetics program. Laboratory course in experimental methods in molecular genetics. Prerequisite: Consent of the instructor.



**512. Experimental Design and Analysis in Molecular Genetics. 4 Hours.** Methods and logic in the analysis of gene function, gene cloning, analysis of genetic changes, studies of gene expression, design of experimental controls. Prerequisite: Bche 460 or consent of the instructor.

**513. Molecular Basis of Cell Growth and Differentiation. 4 Hours.** Oncogenes, tumor suppressor proteins and growth factors, and their roles in tumorigenesis, cell growth, differentiation and development. Prerequisite: Bche 460 or consent of the instructor.

**514. Structure and Function of Nucleic Acids. 4 Hours.** Describes the structure and function of nucleic acids. Unravels the basic molecular mechanisms underlying heredity, including replication, transcription and recombination. Prerequisite: Bche 460 or consent of the instructor.

**515. Journal Club. 1 Hour.** May be repeated for credit. Student presentation and critical analysis of recent journal articles and current topics in molecular genetics. Prerequisite: Consent of the instructor.

**526. Molecular and Genetic Analysis of Development. 3 Hours.** Same as BioS 526. Examines developmental mechanisms used in animal and plant model systems. Lecture. Prerequisite: Graduate standing or consent of the instructor.

**594. Special Topics in Molecular Genetics. 1 to 4 Hours.** May be repeated for credit if topic varies for each registration. Advanced course on selected topics in molecular genetics. Topics will vary from year to year. Prerequisite: Consent of the instructor.

**595. Student Research Seminars. 1 Hour.** May be repeated for credit. S/U grade only. Research presentations by graduate students in the Molecular Genetics program. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Independent dissertation research by the student, under the guidance of the adviser. Prerequisite: Advanced standing in the PhD in Molecular Genetics program.

## Native American Studies (NAST)

**471. Studies in Native American Literatures. 4 Hours.** Same as Engl 471. May be repeated for a maximum of 8 hours of credit. The history and development of literature by and about American Indians. Content varies.

## Neuroscience (Neus)

**580. Themes in Neuroscience. 2 Hours.** Same as BioS 580. May be repeated for credit. Survey of two or three topics in neuroscience with an emphasis on recent research advances. Research that spans the areas under consideration will be emphasized.

**582. Methods in Modern Neuroscience. 2 Hours.** Animals used in instruction. Same as BioS 582. Underlying principles and applications of techniques used to analyze nervous system organization and function. Behavioral, electrophysiological, anatomical, and biochemical approaches are considered.

**583. Practicum in Neuroscience Methods. 3 Hours.** Same as BioS 583. Technologically intense laboratory experience in the methods used by neuroscientists to solve research problems. Demonstrations and discussions complement laboratory exercises. Prerequisite: Neus 582.

## Nursing Sciences (NuSc)

**402. Ethics in Nursing. 2 Hours.** Examines selected ethical concepts in nursing practice and administration. Critical analysis of ethical theories, principles, and rules. Ethical reasoning applied to nursing situations. Prerequisite: Consent of the instructor.

**440. Wholistic Health: Use of Self. 2 Hours.** Spiritual assessment of self, individuals and families. Self as a therapeutic agent/health provider for wholistic health care. Prerequisites: Consent of the instructor.

**441. Wholistic Health: Community Focus. 2 Hours.** Community and congregational assessment. Faith community as a place of healing self and providing wholistic health care as a member of a multidisciplinary team. Prerequisite: Consent of the instructor.

**442. Wholistic Health Care Systems. 2 Hours.** Integration of health and faith to influence and change for wholistic health care

systems using negotiation, community development, coalitions, and advocacy at local, regional, national, and international levels. Prerequisite: Consent of the instructor.

**450. Women and Mental Health Nursing. 3 Hours.** Same as GWS 450 and NuPs 450 and NuWH 450. Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. Prerequisite: Consent of the instructor.

**455. Women's Health: A Primary Health Care Approach. 3 Hours.** Same as CHSc 456 and NuPH 455 and NuWH 455. Health promotion and disease prevention in women's health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

**465. International Nursing. 2 Hours.** Previously listed as NuPH 465. Forum for exchange of ideas, experiences, and readings on effect of political structures, socio-cultural and economic forces on health care systems and nursing education. Prerequisite: Consent of the instructor.

**494. Special Topics. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Discusses selected topics of current interest. Offered according to sufficient student demand and instructor availability. Prerequisite: Consent of the instructor.

**505. Philosophy of Science for Health Research. 3 Hours.** Traces the development of scientific reasoning and explanation from Aristotle to the present, focusing on the nature of knowledge and role of truth for health research. Prerequisites: NuSc 527 or the equivalent and consent of the instructor.

**506. Theory and Theory Development for Nursing Research. 3 Hours.** Methods of theory development and critical analysis of selected biological, behavioral, health service, and grand nursing theories which form the basis of nursing science are examined. Prerequisite: NuSc 505.

**511. Advanced Research Design. 4 Hours.** In-depth analysis of research design, including such areas as design appropriateness and validity, sampling, research ethics, and interpretation. Application of the content to nursing and related fields. Prerequisites: NuSc 527 or the equivalent and consent of the instructor.

**515. Measurement in Health Research. 4 Hours.** Qualitative and quantitative measurement theories; assessment of reliability, validity, and data quality. Critical analysis of measurement issues across the continuum of measures in health research. Prerequisite: NuSc 511 or the equivalent or consent of the instructor.

**517. Advanced Research Practicum. 1 to 4 Hours.** Must be repeated for a minimum of 3 hours credit; may be repeated for a maximum of 6 hours of credit. S/U grade only. An intensive guided research practicum in design, data collection, psychometric analysis or specific analytic technique relevant to the student's research specialization. Prerequisites: NuSc 515 and two advanced statistics courses.

**525. Intermediate Statistics. 3 Hours.** Application and interpretation of statistical techniques appropriate for health sciences. Prepares students to think quantitatively, use the computer to perform statistical analysis, and assess data critically. Prerequisite: An undergraduate statistics course.

**526. Nursing Inquiry I. 2 Hours.** The first of a two-course sequence on the process and application of nursing inquiry; emphasizes approaches to inquiry, theory analysis, constructs, measurement and theory generation. Prerequisite: Credit or concurrent registration in NuSc 525 or the equivalent.

**527. Nursing Inquiry II. 2 Hours.** A continuation of NuSc 526, emphasizing the methods of theory development and theory testing in selected areas of nursing sciences. Ethical issues in research. Prerequisite: NuSc 526.

**528. Health, Environment, and Systems. 2 Hours.** Examination of international, national and local environments for health, health systems, health policy and their outcomes. Influence of social, cultural, and ethical factors.

**529. Issues of Advanced Practice in Nursing. 1 Hour.** May be repeated for credit for students enrolled in specific nursing concentrations. Students may register for more than one section per term. Examines advanced practice in nursing from historical, contemporary, and future dimensions. Prerequisite: NuSc 528.

**530. Physiologic Basis of Nursing Practice Across the Lifespan. 4 Hours.** Advanced contemporary physiologic principles and their relevance to clinical practice. Content topics will include developmental (lifespan) physiologic changes. Prerequisite: An undergraduate physiology course or consent of the instructor.

**531. Pharmaceutical Intervention in Advance Practice in Nursing. 3 Hours.** Advanced principles of pharmaceutical intervention. Includes legal issues, client adherence and medication selection factors. Prerequisite: Credit or concurrent registration in NuSc 530 or the equivalent or consent of the instructor.

**532. Comprehensive Health Assessment for Advanced Practice. 2 to 3 Hours.** Students registering for three credit hours must register for two extra laboratory-discussion hours per week. Includes physical, psychosocial, developmental, occupational, sexual, cultural assessments across the lifespan, emphasizing differences between normal and abnormal. Students synthesize results in client's health status. Prerequisite: NuSc 210 or the equivalent or consent of the instructor.

**533. Applied Pharmaceutical Intervention in Advanced Practice in Nursing. 1 Hour.** May be repeated for a maximum of 2 hours of credit. Application of pharmacology principles to sub-specialty populations. Prerequisite: Credit or concurrent registration in NuSc 531.

**540. Instructional Strategies for the Nurse Educator. 3 Hours.** Introduction to educational theory, methods, and strategies for nursing instruction and evaluation in classroom, clinical, and online teaching. Prerequisite: Consent of the instructor.

**541. Teaching Practicum for the Nurse Educator. 3 Hours.** Application of educational theory, methods, and strategies for nursing education, curriculum development, program evaluation or education administration in classroom, school, clinical or other selected settings. Prerequisites: Credit or concurrent registration in NuSc 540 or credit or concurrent registration in NuSc 542; and consent of the instructor.

**542. Curriculum Processes in Nursing Education. 3 Hours.** Builds on basic instructional strategies to prepare the nurse educator for faculty role in various levels of programs, including curriculum design and evaluation. Prerequisite: Consent of the instructor.

**543. Issues for Nurse Educators and Administrators. 3 Hours.** Focuses on issues in nursing education administration in the context of society, health care, and nursing, especially strategic planning, resources, political influences, conflict, change and leadership. Prerequisites: NuSc 541 and NuSc 542; and consent of the instructor.

**544. Qualitative Research in Nursing. 4 Hours.** Major approaches to qualitative research including design, conduct, reporting, and firsthand experience in data collection and analysis. Prerequisite: Consent of the instructor.

**545. Concept Development in Nursing. 3 Hours.** The contribution of concept analysis to the development of nursing theory is emphasized and specific approaches to concept analysis are examined. Prerequisite: Consent of the instructor.

**546. Issues in Nursing Education Administration II. 3 Hours.** Focuses on executive development in nursing education programs, policy formulation, executive and college relationships to external societal influences. Prerequisite: Consent of the instructor. Credit in NuSc 543 is highly recommended.

**550. Issues for Research and Practice in Women's Health. 3 Hours.** Same as NuAS 550 and NuWH 550. Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women's health care practice are developed as a basis for research. Prerequisite: Consent of the instructor.

**554. Comparative International Health Systems and Nurses' Management. 2 Hours.** Management of health services in the context of national health systems in developed, developing, and least developed countries. Prerequisite: NuSc 528 and consent of the instructor.

**555. Theories and Methods in Women's Health Nursing Research. 3 Hours.** Same as NuWH 555. Critical analysis of theoretical and methodological approaches in women's health nursing research. Emphasis on evaluation scheme useful to researchers. Prerequisites: NuAS 550 and consent of the instructor.

**560. Theoretical Basis for Primary Health Care. 3 Hours.** Students analyze the conceptual basis of primary health care

applicable to diverse communities and develop a primary health care model specific to a community of interest.

**561. Ethical Issues in Primary Health Care. 3 Hours.** Examination of the ethical components of primary health care as a philosophy, strategy, and level of care; and explication of personal framework for analysis of a specific health issue. Prerequisite: NuSc 560 or consent of the instructor.

**562. Primary Health Care Research Methods. 3 Hours.** Conceptual issues, advanced methodologies and dissemination strategies for scientifically sound and policy relevant global primary health care research. Building community relationships for primary health care research. Prerequisites: NuSc 560 and NuSc 511 or the equivalent or consent of the instructor.

**565. Advanced Research in Women's Health. 1 to 2 Hours.** Same as NuPH 565 and NuWH 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique on-going and developing research. Prerequisite: Consent of the instructor.

**570. International Dimensions in Women's Health. 3 Hours.** Same as NuPH 570 and NuWH 570. Critical examination of the health of women from a global perspective. Emphasizes resources and strategies nurse researchers use to monitor women's health across cultures and countries. Prerequisite: Consent of the instructor.

**575. Minority Women's Health Nursing. 3 Hours.** Same as NuWH 575. Theoretic and descriptive overview of the health concerns and health conditions of women from ethnic/racial minority backgrounds with implications for nursing research and practice. Prerequisite: Consent of the instructor.

**585. Advanced Research Seminar. 1 to 2 Hours.** May be repeated for credit: a minimum of 2 hours credit is required; a maximum of 4 hours of credit may be applied toward the PhD degree. Students may register for more than one section per term. S/U grade only. Integrates theory and methods for health research. Topics vary according to student interests and instructor availability. Prerequisites: Consent of the instructor. Open only to PhD degree students.

**590. Leadership in Scientific Careers. 1 Hour.** S/U grade only. For doctoral students only. Analyzes components of leadership in science at the national and global levels. Analyzes factors and issues of the discipline affecting a research career. Analyzes the interdependency of the science to policy cycles of influence. Prerequisite: NuSc 517.

**594. Special Topics: Advanced. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Discusses selected topics of current interest. Offered according to sufficient student demand and instructor availability. Prerequisite: Consent of the instructor.

**595. Seminar in Nursing. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Identifies and analyzes a broad range of issues related to modern nursing and nursing research. Topics vary according to student interests and instructor availability. Prerequisite: Consent of the instructor.

**596. Independent Study: Graduate. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Selected problems in nursing are investigated under the direction of a graduate faculty member. Modes of investigation are determined by the nature of the nursing problem selected. Prerequisite: Consent of the instructor.

**597. Project Research: Master's. 0 to 16 Hours.** S/U grade only. Master's student project research. Prerequisite: Consent of the instructor.

**598. Thesis Research: Master's. 0 to 16 Hours.** S/U grade only. Master's student thesis research. Prerequisite: Consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. Doctoral student thesis research. Prerequisite: Consent of the instructor.

## Occupational Therapy (OT)

**401. Occupational Performance in Adults and Adolescents. 4 Hours.** Reviews the primary developmental aspects and roles of adolescence and adulthood. Personal and environmental factors that influence occupational performance and prevention and wellness models to facilitate occupational functioning. Prerequisite: Admission to the MS in Occupational Therapy program.

**406. Development of a Therapeutic Self. 3 Hours.**

Emphasizes understanding and developing foundational skills in therapeutic use of self and forms of therapeutic reasoning. Group theory and process is introduced and group leadership skills developed. Prerequisite: Admission to the MS in Occupational Therapy Program.

**407. Introduction to Occupational Therapy Practice. 2 Hours.** Overview of the role of the therapist and aspects of occupational therapy practice in multiple settings. The basics of assessment, treatment planning, intervention, and documentation; as well as service delivery systems and current issues. Prerequisite: Admission to the MS in Occupational Therapy program.

**411. Occupational Performance in Children. 4 Hours.** Developmental theories concerning factors influencing the development of occupational performance in infancy, childhood, and early adolescence. Developmental assessment methods and tools. Prerequisites: Grades of C or better in OT 401 and 407 and consent of the instructor.

**412. Human Structure and Function. 5 Hours.** Anatomical and physiological basis for occupational performance. Features structure and function of musculoskeletal, cardiovascular and nervous systems and application of biomechanical principles. Prerequisite: Admission to the MS in Occupational Therapy program.

**416. Occupational Therapy Practice: Psychosocial Aspects of Occupational Performance. 3 Hours.** Occupational therapy practices relevant to psychosocial intervention, related bodies of knowledge influencing practice, psychological process affecting occupational functioning and assessment and treatment related to psychosocial problems. Prerequisites: Grade of C or better in OT 401 and Grade of C or better in OT 407; and consent of the instructor.

**420. Community Practicum. 1 Hour.** May be repeated for credit. S/U grade only. Field experience in a community agency serving an urban population. Emphasis is on service learning in context and the development of professional behaviors. Field work required. Prerequisite: Admission to the MS in Occupational Therapy program.

**422. Medical Conditions. 1 Hour.** S/U grade only. This self-paced course reviews etiology, clinical manifestation, clinical course, and general medical and rehabilitative management of common medical conditions; emphasis placed on musculoskeletal, neurologic, cardiopulmonary, and psychiatric disorders. Prerequisite: Admission to the MS in Occupational Therapy program.

**424. Contexts of Occupational Therapy Practice. 2 Hours.** Trends in health care, reimbursement, legislation, and disability policy and how they affect occupational therapy. The policy process and development of an advocacy role. Exposure to community based practice and consultation roles. Prerequisite: Grade of C or better in OT 407.

**428. Fieldwork Level I. 3 Hours.** Application of occupational therapy theory and therapeutic reasoning in a 40-hour fieldwork experience with the opportunity to develop beginning therapeutic skills and professional behavior. Prerequisites: Grades of C or better in OT 411, 412, and 416 and satisfactory completion of OT 422, and consent of the instructor.

**436. Occupational Therapy Practice: Functional Movement and Mobility. 5 Hours.** Application of occupational therapy evaluation and intervention skills to children and adults with occupational performance deficits resulting from mobility and movement dysfunction. Prerequisites: Grades of C or better in OT 411, 412, and 416, and satisfactory completion of OT 422.

**437. Occupational Therapy Practice: Cognition and Perception in Action. 4 Hours.** The impact of impaired cognitive and perceptual processes on occupational performance of children and adults with neurological conditions, cognitive and intellectual disabilities and psychiatric disabilities. Prerequisites: Grades of C or better in OT 411, 412, and 416, and satisfactory completion of OT 422.

**447. Ethnographic Research in Health and Human Services I. 4 Hours.** Same as Dis 447. Course for practitioners and researchers who are not well-versed in ethnography, details strategies for conducting ethnographic research in health and human service contexts. Prerequisite: Consent of the instructor.

**448. Fieldwork Level IIA. 8 Hours.** S/U grade only. First of two supervised, full-time 12-week practica with emphasis on application of occupational therapy theory, development of psychomotor skills, reasoning client related problems, and professional socialization as an

entry-level occupational therapist. Prerequisites: Grades of C or better in OT 428, 436, and 437 and consent of the instructor.

**449. Fieldwork Level IIB. 8 Hours.** S/U grade only. Second of two supervised, full-time 12-week practica with emphasis on application of occupational therapy theory, development of psychomotor skills, reasoning client related problems, and professional socialization as an entry-level occupational therapist. Prerequisites: Grades of C or better in OT 428, 436, and 437 and consent of the instructor.

**461. Advanced Fieldwork Practicum. 3 to 12 Hours.** S/U grade only. Supervised fieldwork practicum to advance clinical skills in a specialty area of practice. Prerequisite: OT 351 or consent of the instructor.

**500. Theories of Occupational Therapy. 4 Hours.** Develops an understanding of the theoretical basis of occupational therapy and the impact of theory on clinical practice. Covers the history of knowledge and practice development in the field. Focuses on specific practice models developed as guides to clinical reasoning. Prerequisite: Consent of the instructor.

**510. Research in Occupational Therapy. 3 Hours.** Introduction to basic elements of research design relevant to occupational therapy practice. Prepares student to become critical consumer of research in occupational therapy and related fields. Quantitative and qualitative approaches to research. Prerequisite: Admission to the MS in Occupational Therapy program, or consent of the instructor.

**515. Synthesis I. 1 Hour.** S/U grade only. Integrating theory, practice and research knowledge and skills across courses using case studies, and small group learning activities. Prerequisites: Grades of C or better in OT 401, 406, 407, 500, and AHS 510.

**526. Assistive Technology and the Environment. 3 Hours.** Assessing the need for, delivering, and evaluating the outcomes of occupationally-based technology and environmental interventions with people with disabilities within the home, school, workplace and community. Prerequisites: Grades of C or better in OT 411, 412, 416, and AHS 510.

**530. Advanced Field Experience: Clinical Specialization in Occupational Therapy. 1 to 4 Hours.** S/U grade only. Provides opportunity for the student interested in advanced occupational therapy practice to observe a master clinician and participate in treatment and/or clinical research. Prerequisite: Consent of the instructor.

**531. Advanced Field Experience in Occupational Therapy Management. 1 to 4 Hours.** S/U grade only. Practicum experience working with an experienced professional to develop projects or programs in student's interest area, e.g., administration, middle management, consultation, program evaluation, and grantsmanship. Prerequisite: Consent of the instructor.

**532. Advanced Field Experience: Occupational Therapy Education. 1 to 4 Hours.** S/U grade only. Provides opportunity to observe, prepare, and present lectures/labs to occupational therapy students in technical or professional curricula or to develop skills as a clinical educator. Prerequisite: Consent of the instructor.

**534. Socio-Cultural Aspects of Occupational Therapy. 3 Hours.** Addresses social and cultural contexts in which chronic illness and disability are experienced; contexts which impact that experience, and broad contexts in which recovery/accommodation and occupational therapy treatment occur. Prerequisites: Grades of C or better in OT 424, 428, and 526.

**535. Synthesis II. 2 Hours.** S/U grade only. Integrating advanced theory, practice and research knowledge and skills across courses using complex individual and programmatic case studies and small and large group intervention planning activities. Prerequisites: Grade of C or better in OT 424, 428 and 526; and satisfactory completion of OT 422.

**540. Advanced Topics in Occupational Therapy Research and Evaluation. 4 Hours.** Students may register for more than one section per term. In-depth presentation of selected research/measurement strategies. Specific topics vary and include single system design, survey research, ethnography, evaluation of clinical effectiveness. Prerequisite: Consent of the instructor.

**541. Advanced Human Occupation Theory and Application. 4 Hours.** Provides an advanced understanding of evaluation, intervention, program development and research based on the model of human occupation. Focuses on use of the model to address



psychosocial problems in a range of disabled persons. Prerequisite: OT 400 or consent of the instructor.

**543. Clinical Reasoning in Occupational Therapy. 4**

**Hours.** Comparison of current approaches to study of clinical reasoning in health professions. Emphasis on phenomenological approaches. Prerequisite: Consent of the instructor.

**545. Advanced Concepts in Work Rehabilitation. 4**

**Hours.** Same as CHSc 565. Presents current theory, research, and clinical practice in work-related rehabilitation of physically-injured, psychiatric, and neurologically-impaired clients. Prerequisite: Consent of the instructor.

**546. Family-Oriented Interventions. 4 Hours.** Promotes responsive intervention programs including characteristics of parenting, and the meanings of illness and disability on the family. Prerequisite: Consent of the instructor.

**547. Ethnographic Research in Health and Human Services II. 4 Hours.**

Same as Dis 547. Provides faculty supervision and peer criticism for students at various stages of proposing and conducting ethnographic research in health and human service contexts. Prerequisite: OT 447.

**550. Disability in the Urban Environment. 4 Hours.**

Same as Dis 550. Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities.

**551. Computers, Communication, and Controls in Rehabilitation Technology. 3 Hours.** Same as DHD 551.

Assistive technology course exploring different methods for evaluating controls used to operate computers, communication devices, and powered wheelchairs. Instruction also addresses device features and integration factors.

**555. Synthesis III. 2 Hours.** S/U grade only. Integrating advanced theory, practice and research knowledge and skills from advanced fieldwork and coursework using complex case studies and small group assessment and intervention planning activities from students' fieldwork experiences. Prerequisite: OT 448.

**560. Dilemmas in Disability Services. 4 Hours.** Same as Dis 560. The complexities inherent in the delivery of therapeutic and related services to persons with disabilities including personal attributes, interpersonal, and contextual components.

**562. Perception-Action Processes in Development and Disability. 4 Hours.** Same as Dis 562. Implications of developmental theory for treatment of disabilities. Special emphasis on perception-action systems and the acquisition of skill.

**564. Administration and Management in Occupational Therapy. 3 Hours.** Overview of issues related to administration and management in varied settings in which occupational therapists practice. Topics include management functions, service planning, quality improvement, financial management and accreditation. Prerequisite: OT 555.

**565. Research Approaches in Rehabilitation**

**Technology Use and Delivery. 3 Hours.** Same as DHD 565 and Dis 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, work site and community.

**566. Narrative and the Phenomenology of Disability. 4 Hours.** Same as Dis 566. Open to master's and PhD students in social sciences, medicine, nursing, social work, education and related health professions. Recent interdisciplinary studies of narrative as they pertain to chronic illness and disability.

**594. Special Topics in Occupational Therapy. 1 to 4 Hours.** New course under development and selected seminar topics of current interests to faculty and students. Prerequisite: Consent of the instructor.

**595. Seminar in Occupational Therapy. 1 Hour.** S/U grade only. Pre-thesis seminar. Students participate in faculty-student discussion and activities related to individual areas of research/thesis. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** This course is for graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

**597. Project Research. 4 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. S/U grade only. Independent scholarship

focusing on problems of application in field. Students undertake an action project, create a method for dissemination, and orally present the project. Prerequisites: Graduate standing in the MS in Occupational Therapy program and consent of the instructor.

**598. Research in Occupational Therapy. 0 to 16**

**Hours.** S/U grade only. Students may register for more than one section per term. MS students are required to take a minimum of 7 credit hours. Independent research in occupational therapy, directed by a faculty member. Prerequisite: Foundation courses in research methods (such as AHS 510) and statistics or consent of the instructor.

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**Oral and Maxillofacial Surgery (OSur)**

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**501. Applied Anatomy of the Head and Neck I. 3**

**Hours.** Dissection of the head and neck with emphasis on surgical approaches and techniques. Prerequisite: Anat 312 or the equivalent.

**510. Conscious Sedation and General Anesthesia. 3**

**Hours.** S/U grade only. May be repeated for credit. Didactic lectures in all phases of pain and anxiety control supplemented with clinical experience in administration of general anesthetic and inhalation and intravenous sedatives.

**511. Oral Surgery Seminar. 2 Hours.** S/U grade only.

Lecture, seminars, conferences and journal clubs dealing with current topics of clinical and research interest.

**513. Craniofacial Deformity Seminar. 1 Hour.** S/U grade

only. May be repeated for credit. Discusses the investigation, evaluation, treatment planning and follow-up monitoring of patients with dentofacial deformities. Prerequisite: Admission to the oral and maxillofacial surgery residency or orthodontics graduate program.

**530. Oral and Maxillofacial Surgery Diagnostic**

**Seminar. 2 Hours.** S/U grade only. A series of seminars dealing with differential diagnosis and treatment of oral lesions.

**532. Diagnosis and Treatment Planning in**

**Orthognathic Surgery. 2 Hours.** Non-orthognathic surgical topics of practical interest to orthodontists and their professional interrelationships with oral and maxillofacial surgeons.

**533. Oral and Maxillofacial Surgery Literature Review.**

**2 Hours.** S/U grade only. This course will cover the methodology for critical review of medical literature and discuss key articles appearing in appropriate medical journals.

**561. Physical Diagnosis. 4 Hours.** In-depth methods of obtaining a history and performing physical diagnosis of the entire body through theoretical and practical lesions.

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**Oral Medicine and Diagnostic Sciences (OMDS)**

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**424. Oral Pathology. 4 Hours.** Diseases of teeth, periodontium, facial bones, muscles, nerves and mucous membranes of the oral region, and salivary glands. Introduction to clinical differential diagnosis. Prerequisites: Anat 312, Bche 411, Hstl 451, PhyB 321 and Path 421.

**501. Advanced Oral Pathology I. 2 Hours.** Detailed consideration of oral cysts, odontogenic tumors, and diseases of facial bones, blood and lymphoreticular systems, and salivary glands. Journal literature used. Prerequisite: OMDS 424 or the equivalent.

**502. Advanced Oral Pathology II. 2 Hours.** Detailed consideration of oral cancer and other lesions of oral mucosa, dental caries, inflammatory periodontal disease, skin lesions and microscopic diagnosis techniques. Journal literature used. Prerequisite: OMDS 424 or the equivalent.

**519. Electron Microscopy Seminar. 1 Hour.** A student speaker makes a seminar type presentation about a topic and follows this with a discussion involving electron microscopy. Prerequisite: Consent of the instructor.

**527. Oral Biology Seminar. 1 Hour.** Same as Hstl 514. S/U grade only. Invited speakers present the progress of current research work in their field of interest related to oral tissues. Prerequisite: Consent of the instructor.

**529. Electron Microscopy in Dentistry. 1 Hour.** Same as Hstl 515. Principles, theory, and practice of transmission and scanning electron microscopy, and energy dispersive x-ray microanalysis. Processing, sectioning, staining and examination of tissues. Prerequisite: Consent of the instructor.

**595. Seminar in Oral Pathology. 2 Hours.** S/U grade only. Reviews, reports, and discussion topics are drawn from the literature and material of surgical oral pathology. Prerequisite: Consent of the instructor.

**598. Research in Oral Pathology. 0 to 16 Hours.** S/U grade only. Independent thesis research on basic biomedical phenomena or specific oral disease(s). Prerequisite: Consent of the advisor.

## Oral Sciences (OSci)

**451. Research Methodology. 1 Hour.** Primarily intended for students enrolled in the Master of Science in Oral Sciences degree program. Designed to help the student understand, utilize and appreciate the process of scientific inquiry. Prerequisite: Matriculation into the Master of Science in Oral Sciences program, or courses in basic biological sciences or the equivalent background and consent of the instructor.

**452. Biological Basis of Oral Diseases. 2 Hours.** Focuses on the biological basis of oral disease and modern concepts in the biomedical sciences. Prerequisites: Matriculation into the Master of Science in Oral Sciences program, or BChe 411 and Hstl 451 or the equivalent courses, or consent of the instructor.

**580. Seminar in Oral Sciences I. 1 Hour.** S/U grade only. Faculty led. Presentation and discussion of original research followed by a question/answer/discussion session between faculty members presenting, supporting faculty and students. Prerequisite: Graduate standing in the Master of Science in Oral Sciences program or consent of the instructor.

**581. Seminar in Oral Sciences II. 1 Hour.** S/U grade only. Student led. Seminars include presentations and discussion of selected key papers by the student in his or her field of research. Prerequisite: Graduate standing in the Master of Science in Oral Sciences program or consent of the instructor, and OSci 580.

**590. Hominid Evolution, Dental Anthropology, and Human Variation. 1 Hour.** Evolution; hominid origins; organization and development of human dentition, agenesis, metric and non-metric variation in tooth form, human growth and maturation, variation and adaptation. Prerequisite: Consent of the instructor.

**593. Independent Research in Oral Sciences. 1 to 8 Hours.** S/U grade only. Faculty supervised research projects. Research may not duplicate that being done in OSci 598. Prerequisite: Consent of the instructor.

**594. Special Topics in Oral Sciences. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Content varies. Selected topics of current interest in oral sciences. Prerequisites: Graduate or postgraduate standing and consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Faculty-supervised independent study not included in regular course offerings. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Thesis research to fulfill master's degree requirements. Prerequisites: Matriculation into the Master of Science in Oral Sciences program and consent of the Director of Graduate Studies.

## Orthodontics (Ortd)

**513. Craniofacial Growth and Development. 4 Hours.** Physiology of the stomatognathic system, behavioral development, implications of craniofacial growth and development, reactions of periodontal tissues to applied force and prevalence; causes of malocclusion. Prerequisite: Matriculation into Certificate Program in Orthodontics or MS in Oral Sciences program.

**521. Methodologies in Craniofacial Research. 1 Hour.** Demonstration and discussion of the techniques and methods employed in the study of the structure, growth and function of the craniofacial region.

**524. Craniofacial Anomalies I. 2 Hours.** Introduction to a variety of orofacial clefts, etiology, clinical presentation, growth and development and habilitation via an interdisciplinary team approach. Longitudinal analysis of cases with cleft lip and palate.

**525. Craniofacial Anomalies II. 1 Hour.** Introduction to treatment aspects of patients with orofacial clefts and to a variety of

craniofacial anomalies, their etiology, clinical presentation, growth and development and habilitation through a team approach. Clinical rotations through the Center for Craniofacial Anomalies. Prerequisite: Ortd 524.

**537. Biostatistics Applied to Craniofacial Research. 2 Hours.** Multivariate statistical techniques applied to craniofacial growth research. Prerequisites: Ortd 523 and a basic univariate statistics course.

**595. Seminar in Orthodontics. 1-2 Hours.** May be repeated for a maximum of 13 hours of credit. S/U grade only. Presentations by selected guest lecturers on research or clinical material relating to matters of interest to the Department of Orthodontics. Prerequisite: Enrollment in the orthodontics post-graduate or oral sciences graduate program.

## Pathology (Path)

**421. General Pathology—Dental. 3 Hours.** Basic principles of pathological processes. Prerequisites: Anat 440, Path 407, and PhyB 401, or consent of the instructor.

**422. Systemic Pathology—Dentistry. 3 Hours.** Disease process affecting specific organs. Prerequisite: Path 421.

**425. General Pathology. 3 Hours.** Basic principles of pathological processes, including tissue injury and repair, inflammation, circulatory disturbances, retrograde processes and tissue responses to specific infectious agents and neoplasms. Prerequisites: Anat 440 or 425 or the equivalent and PhyB 401 or the equivalent, or consent of the instructor.

**426. Organ Pathology. 5 Hours.** The disease processes affecting specific organs and anatomic systems. Prerequisite: Path 425 or consent of the instructor.

**427. Clinical Pathology. 4 Hours.** Practical application of the clinical aspects of laboratory medicine. Emphasizes problem solving at the laboratory level and clinico-pathological correlation. Prerequisite: Path 425 and consent of the instructor.

**500. Concepts of Scientific Inquiry. 1 Hour.** Analyzes the design, execution and reporting of scientific investigations to help develop insight into the research process.

**501. Experimental Pathology. 3 Hours.** Survey of experimental pathology: general principles and techniques. Prerequisites: Path 425 and 426 or the equivalents, or consent of the instructor.

**503. Molecular Pathology. 2 Hours.** Molecular pathology principles and techniques; application to unfold molecular basis of disease. Molecular diagnostic testing to determine disease by examining RNA, DNA or protein. Prerequisite: Path 501.

**505. Quantitative Morphology. 2 Hours.** Same as Anat 505. Principles and practice of morphometry and stereology, which are methods for quantitating structure. Specific application to the histological and ultrastructural levels of anatomy and pathology. Prerequisites: Path 425 and 504, or Anat 442, or consent of the instructor.

**506. Medical Immunology. 2 Hours.** Role of immune process in health and disease. Prerequisites: Path 425, and MIm 451 or the equivalent or consent of the instructor.

**507. Physiological Basis of Pathology. 2 Hours.** Same as Hstl 507. Subject matter allied to general pathology but going deeper into physical chemistry and physiological principles, as set forth in N.R. Joseph's Comparative Physical Biology. Prerequisite: Hstl 401 or Path 421 and 422.

**508. Clinical Pathophysiology I. 3 Hours.** Pathophysiologic alterations that occur as the result of disease. Emphasizes the following disease processes: neoplastic, infectious, immunological, hematologic, cardiovascular, respiratory, and renal. Prerequisites: Path 425 and Path 426.

**509. Clinical Pathophysiology II. 3 Hours.** Continuation of Pathology 508. Pathophysiologic disease processes in the following systems: gastrointestinal, hepatobiliary, nervous, female and male genitourinary, skin, musculoskeletal and endocrine. Prerequisite: Path 508.

**520. General Clinical Chemistry. 3 Hours.** Same as MLS 520. Clinically significant lipids, enzymes, hormones, trace metals and vitamins; acid-base and electrolyte balance; medical relevance; methods of analysis/automation; therapeutic drug monitoring and toxicology. Prerequisite: Consent of the instructor.

**522. Clinical Biochemistry. 5 Hours.** Clinical chemistry principles and techniques and its role in diagnosis and treatment; chemistry of major body constituents in health and disease; effective use of the laboratory. Prerequisite: Bche 460 or the equivalent.

**527. Clinical Laboratory Method Evaluation. 3 Hours.** Same as MLS 527. Includes development and comparison of clinical laboratory methods; also, statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. Prerequisite: Consent of the instructor.

**530. Medical Bacteriology. 3 Hours.** Principles, theory and practice of diagnostic bacteriology and infectious diseases. Prerequisite: MIm 452 or the equivalent.

**534. Medical Mycology, Parasitology, and Virology. 3 Hours.** An advanced microbiology course on the latest theoretical and practical concepts of human pathogenic fungi, protozoa, helminths and viruses and their relation to disease and diagnosis. Prerequisite: MIm 452 or consent of the instructor.

**595. Pathology Seminar and Journal Club. 2 Hours.** S/U grade only. Weekly seminar and journal club covering selected fields of interest and research in pathology.

**598. Master's Thesis Research. 0 to 16 Hours.** Students may register for more than one section per term. S/U grade only. Research in experimental pathology towards MS degree.

**599. PhD Thesis Research. 0 to 16 Hours.** Students may register for more than one section per term. S/U grade only. Research in experimental pathology towards a PhD degree.

## **Pediatric Dentistry (PedD)**

**410. Principles and Methods in Dental Research I. 2 Hours.** Introduces students to several of the more commonly used statistical, procedures for testing hypotheses; provides students with a beginners set of tools for using statistics. Prerequisites: Enrollment in post-graduate or graduate program in pediatric dentistry.

**411. Principles and Methods in Dental Research II. 2 Hours.** Designed to provide the student with an understanding of the scientific method. Prerequisite: PedD 410.

**501. Dental Pediatrics I. 2 Hours.** The pathophysiology and biologic basis of the neurologically, mentally and medically compromised developing child and the implications to dental management and research.

**502. Dental Pediatrics II. 2 Hours.** The pathophysiology and biologic basis of the neurologically, mentally and medically compromised developing child and the implications to dental management and research. Prerequisite: PedD 501.

**595. Pediatric Dentistry Seminar. 2 Hours.** S/U grade only. Presentation and discussion of current literature and research in pediatric dentistry, medical and dental aspects of pulpal therapy, traumatology, fluorides and cariology. Provides behavior guidance and application of material from other areas.

## **Pharmaceutics (PmPc)**

See Biopharmaceutical Sciences (BpS)

## **Pharmacodynamics (PmPd)**

See Biopharmaceutical Sciences (BpS)

## **Pharmacognosy (PmPg)**

**480. Biological Evaluation of Natural Products. 3 Hours.** Short-term procedures useful for the discovery and characterization of natural product drugs, with related laboratory experiments, and principles of more advanced drug development. Prerequisite: Consent of the instructor.

**510. Research Techniques in Pharmacognosy. 3 Hours.** Introduction to the techniques used in pharmacognosy.

**511. Advanced Pharmacognosy. 4 Hours.** A theoretical and applied course designed to acquaint the student with the occurrence, isolation, characterization, identification, biosynthesis and activity profile of biologically active natural products. Prerequisite: PmPg 510 or the equivalent or consent of the instructor.

**512. Microscopy of Natural Drug Products. 3 Hours.** Use of microscopic methods in the identification of natural drugs and

herbal products, with emphasis on the use of light and scanning electron microscopes. Prerequisite: PmPg 517 or consent of the instructor.

**513. Structure of Biopolymers. 3 Hours.** Same as Bche 513 and MIm 513. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: BChE 460 and a year of physical chemistry; or consent of the instructor.

**515. Structure Elucidation of Natural Products I. 2 Hours.** A review of modern spectroscopic and chemical techniques as applied to the determination of structure of natural products. Prerequisites: PmPg 511 and MdCh 562.

**516. Structure Elucidation of Natural Products II. 2 Hours.** A review of modern spectroscopic and chemical techniques as applied to the determination of structure of alkaloidal natural products. Prerequisites: PmPg 511 and MdCh 562.

**517. Problem-Solving in Plant Taxonomy. 4 Hours.** Principles and concepts in plant taxonomy, which include identification, classification, nomenclature, discussion of major recent/modern systems, family characterization and field work methods. Prerequisite: Consent of the instructor.

**518. Correlative Phytochemistry. 2 Hours.** Distributional correlation of well-defined groups of secondary phytoconstituents with existing plant classification systems as an aid in the search for biologically active natural products. Prerequisite: PmPg 517.

**519. Fermentation and Biotransformation. 2 Hours.** The fermentation and biotransformation of natural products will be examined. Prerequisite: PmPg 511.

**520. Ethnopharmacology Field Work. 4 Hours.** Studies of plants used by primitive peoples as medicinal agents, in defined geographic areas, primarily through interviews with medicine men and the populace. Plant material will be collected for subsequent study. Prerequisites: PmPg 517 or consent of the instructor. Contingent on the availability of funds for travel support.

**521. Recent Advances in Pharmacognosy. 2 Hours.** A review of recent progress in the chemistry, biosynthesis and biological properties of natural products. Prerequisite: PmPg 511.

**522. Laboratory Techniques in Pharmaceutical Biotechnology I. 3 Hours.** Students will perform laboratory research rotations as assigned by the Biotechnology track faculty in the three laboratories of the Center for Pharmaceutical Biotechnology in the College of Pharmacy. Prerequisite: Credit or concurrent registration in Bche 460; or consent of the instructor.

**569. Predictive Strategies in Pharmacognosy. 2 Hours.** Consideration of the methods employed for the selection of plants that are most likely to yield biologically active compounds. Prerequisites: Demonstration of competency in organic chemistry, botany and pharmacology.

**595. Seminar in Pharmacognosy. 1 Hour.** May be repeated for a maximum of 2 hours of credit. S/U grade only. Presentation on a current research topic.

**598. Master's Research in Pharmacognosy. 0 to 16 Hours.** S/U grade only. Research for completion of master's degree.

**599. Doctoral Research in Pharmacognosy. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Research for students in the pharmacognosy doctoral program.

## **Pharmacology (Pcol)**

**425. Medical Pharmacology. 6 Hours.** Animals used in instruction. This is a College of Medicine course and does not follow the regular academic calendar. A lecture, conference and laboratory course on human pharmacology. Drug mechanisms, toxicities and kinetics are presented as a foundation to therapeutic application. Prerequisites: Bche 460 and general human physiology.

**430. Principles of Toxicology. 2 Hours.** Same as EOHS 457. Examines the toxic effects of drugs and chemicals on organ systems. Lectures emphasize basic principles, effects on specific organ systems, major classes of toxic chemicals and specialized topics such as forensic and industrial toxicology. Prerequisite: Pcol 425 or consent of the instructor.

**505. Advanced Topics in Receptor Pharmacology and Physiology. 2 Hours.** Same as PhyB 505. Lecture/discussions of theoretical and experimental aspects of neurotransmitter, hormone and



drug interactions with tissue receptors. Topics include drug receptor theory and signal transduction mechanisms. Prerequisite: Bche 460.

**508. Drug Metabolism and Disposition. 2 Hours.**

Animals used in instruction. Basic principles underlying the metabolism and disposition of drugs. Biochemical mechanisms influencing the therapeutic and/or toxic effects of drugs and other foreign compounds. Prerequisite: Consent of the instructor.

**510. Molecular Pharmacology of the Cardiovascular System and Platelets. 2 Hours.**

Novel therapeutic approaches to: failing or dysrhythmic heart, prevention/dissolution of thrombi, vascular tone regulation, platelet dysfunction and platelets as model cells for excitation mechanisms. Prerequisites: Bche 460 and PhyB 401.

**520. Neuropharmacology of Membranes, Channels, Receptors, and Transmitters. 2 Hours.** The mechanisms of pharmacological agents acting on membrane channels, synaptic transmission and neurons will be covered. An emphasis will be placed on drugs as tools in the investigation of central nervous system function. Prerequisite: Pcol 425 or consent of the instructor.

**530. Pharmacology and Biology of the Vessel Wall. 2 Hours.** Regulation of physiological and pathological processes in the cardiovascular system; e.g. endothelial barrier, cell adhesion, smooth muscle proliferation, angiogenesis, endothelial gene expression. Pharmacological treatment of cardiovascular diseases. Prerequisites: Bche 460 and Phyb 401; or consent of the instructor.

**594. Special Topics. 1 Hour.** May be repeated for credit. Organized presentation and discussion of rapidly developing research areas in molecular, cellular and systems pharmacology. Prerequisite: Consent of the instructor.

**595. Pharmacology Seminar. 1 Hour.** May be repeated for credit. S/U grade only. Presentation of research and/or current literature by invited lecturers and students.

**598. MS Thesis Research. 0 to 16 Hours.** S/U grade only. Thesis work under supervision of a graduate advisor.

**599. PhD Thesis Research. 0 to 16 Hours.** S/U grade only. Thesis work under supervision of a graduate advisor.

## Pharmacy (Phar)

**400. Pharmacokinetics. 3 Hours.** Concepts and principles in pharmacokinetics including theories and basis for drug receptor actions, drug absorption, distribution, excretion and biotransformation. Prerequisites: Credit or concurrent registration in Phar 322 and 332 and PhyB 302.

**401. Principles of Drug Action and Therapeutics I. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics and toxicology in the drug actions related to the disease states associated with the endocrine, renal, optical and auditory systems. Prerequisites: PhyB 302 and Phar 400.

**402. Principles of Drug Action and Therapeutics II. 4 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics and toxicology in the areas of the autonomic nervous system, cardiology, lipid disorders and hypertension. Prerequisites: PhyB 302; and Phar 342 and 400.

**403. Principles of Drug Action and Therapeutics III. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of pain management and psychiatric disorders. Prerequisites: Consent of the instructor; and Phar 352 and 401 and 402.

**404. Principles of Drug Action and Therapeutics IV. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics and toxicology in the areas of women's and men's health, respiratory disorders, diabetes and pediatrics. Prerequisites: Consent of the instructor; and Phar 352 and 401 and 402.

**405. Principles of Drug Action and Therapeutics V. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of drug abuse, cerebrovascular diseases, parkinson's and epilepsy. Prerequisites: Consent of the instructor; and Phar 353 and 401 and 402.

**406. Principles of Drug Action and Therapeutics VI. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the area of infectious disease. Prerequisites: Consent of the instructor; and Phar 353 and 401 and 402.

**407. Principles of Drug Action and Therapeutics VII. 4 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of transplants, gastrointestinal disorders, body fluids, nutrition, and the impact of drug therapies on a geriatric person. Prerequisites: Consent of the instructor; and Phar 353 and 401 and 402.

**408. Principles of Drug Action and Therapeutics VIII. 3 Hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of bones and joints, hematological disorders, oncology. Prerequisites: Consent of the instructor; and Phar 353 and 401 and 402.

**460. Introduction to Health Informatics. 1 Hour.** No credit given if the student has credit in BHIS 400 or NuSc 218 or IPHS 420. Same as BHIS 460. Introduction to information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; storage, retrieval, and networking; system security. Taught online with some essential classroom lectures. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisites: Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. Recommended background: IDS 100 or the equivalent.

## Pharmacy Administration (PmAd)

**413. Images of Pharmacy in the Arts. 2 Hours.** Same as MHum 413. Diverse art forms present human dimensions of pharmacy and implications in pharmacy practice, raising issues about professional ethics and personal values of patients and practitioners.

**421. Pharmaceutical Marketing. 3 Hours.** Introduction to the field of marketing with specific emphasis on pharmaceuticals and the marketing of pharmacy services.

**433. Clinical Drug Trials. 2 Hours.** Methods for collecting and evaluating clinical drug trial data to support claims of product safety and efficacy in the approval process. Prerequisites: PmAd 303 and consent of the instructor.

**440. Social Factors in Health & Illness Related to Pharmaceutical Care. 2 Hours.** The human behaviors related to illness/health, with emphasis on the function of pharmacy. Selected topics include professionalism, sociology of drugs and medication use. Prerequisite: Enrollment in the PharmD program or consent of the instructor.

**470. Managed Care Pharmacy. 3 Hours.** Professional development in managed care pharmacy to learn history, administrative and policy aspects, network with operational managers and leaders in field, visit managed care sites and observe activities of managed care pharmacists. Prerequisites: Third-year standing in the Doctor of Pharmacy program or second-year standing in the Doctor of Pharmacy program with consent of the instructor, or graduate standing in pharmacy.

**481. History of Pharmacy. 2 Hours.** The development of pharmacy throughout history with emphasis on American practice. Prerequisite: PmAd 300.

**482. Professional Practice Management. 3 Hours.** Managerial functions of the pharmacist in all practice environments with emphasis on the planning, organizing, staffing, directing, and controlling of resources.

**494. Special Topics in Pharmacy Administration. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Topics will vary, including the on-going analysis of contemporary issues associated with delivery, financing and management of pharmaceutical products and professional services.

**500. Philosophical Issues in Research. 2 Hours.** Same as MHum 500. An in-depth examination of foundational issues underlying research questions of ethics, design, conduct and evaluation pertaining to pharmaceutical preparations.

**502. Research Methods in Pharmacy Administration. 3 Hours.** Focuses on "how-to-do" a research project and "why-to-use" a particular technique including meta-analysis, path analysis, conceptualization, measurements and data processing. Prerequisites: Soc 500 and consent of the instructor.

**507. Pharmacy and Its Environment. 2 Hours.** Factors directly influencing the practice of pharmacy. Roles of the pharmacist as affected by contemporary organizational, legislative, societal and fiscal environments. Prerequisite: Admission into the MS or PhD in Pharmacy program.

**510. Problems in Pharmacy Management. 3 Hours.**

Selective managerial problems relative to pharmacy practice. Field work involves data collection based on individual and group models of the managerial decision process. Prerequisite: PmAd 482 or the equivalent.

**511. Advanced Pharmaceutical Marketing. 3 Hours.**

Marketing issues facing the U.S. major players in the pharmaceutical process including the development and access to pharmaceuticals as well as the regulatory and economic environment. Prerequisite: PmAd 482 or the equivalent or consent of the instructor.

**516. Drug Insurance. 3 Hours.** Theoretical constructs and practical problems in designing, operating and evaluating large drug insurance programs including quality assurance techniques to facilitate rational prescribing and dispensing. Prerequisites: PmAd 507 and consent of the instructor.

**520. Problems in Computer Applications in Pharmacy Administration. 2 Hours.**

Illustrations and applications in pharmacy research pertaining to operating systems, communications protocols, architecture, compilers, programming languages, interpreters, databases, expert systems, and artificial intelligence. Prerequisites: Working ability with the ADN and working knowledge of: one operating system (CMS, DOS, UNIX), one editor, and one statistical analysis package (either mainframe or microcomputer-based).

**525. Medication, Identity, and Illness. 3 Hours.** Concepts and principles of human behavior related to pharmacy practice including understanding of patient behavior and methods to facilitate patient and inter-professional communication. Prerequisites: PmAd 321 or consent of the instructor.

**535. Health Policy and Pharmaceutical Care. 3 Hours.**

Regulatory controls and reform proposals covering drug approval, manufacturing, marketing and use, including problems of drug diversion, lag, orphan products, and patent restoration. Prerequisite: PPA 500.

**571. Principles of Pharmacoeconomics. 3 Hours.**

Evaluation of pharmaceutical services and its role in pharmaceutical firms, in shaping public policy and evaluating the outcome of patient care after drug therapy intervention. Prerequisites: Econ 511; and HPA 522 and PmAd 511 or the equivalents.

**594. Special Topics in Pharmacy Administration. 1 to 3 Hours.**

May be repeated for a maximum of 6 hours of credit. Topics vary. Intensive analysis of contemporary issue(s) associated with delivery and financing of pharmaceutical products and professional services.

**595. Departmental Seminar. 1 Hour.** S/U grade only. May be repeated for credit. Presentation by students, faculty and visiting experts. Topics to be arranged. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Individual research under direction of a member of the faculty. Prerequisites: PmAd 502 or consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Open only to degree candidates. Independent research on topic approved by student's graduate committee. Prerequisite: Consent of the committee.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Open only to degree candidates. Independent research on topic approved by student's graduate committee. Prerequisite: Consent of the committee.

**Pharmacy Practice (PmPr)**

**430. Critical Care I. 2 Hours.** Advanced pharmacotherapeutics course that will concentrate on the medical management and the pharmacist's role in the management of the critically ill patient. Prerequisites: Phar 402, 403, 404, 405, 406 and concurrent registration in Phar 407 and 408 and completion of second year of the program.

**Philosophy (Phil)**

**400. Philosophical Writing. 1 Hour.** Fulfills writing in the discipline requirement. Philosophical issues covered will vary from semester to semester. Must be taken in conjunction with designated 400-level courses. See the undergraduate advisor for details. Prerequisites: Major in philosophy and concurrent registration in a 400-level philosophy course as designated in the Timetable.

**401. Theory of Knowledge. 4 Hours.** Survey and analysis of key topics in epistemology, such as skepticism, the nature of

propositional knowledge, justification, perception, memory, induction, other minds, naturalistic epistemology. Prerequisite: Phil 201 or consent of the instructor.

**403. Metaphysics. 4 Hours.** Intensive treatment of one or more topics, such as free will, personal identity, causation, existence, substance and attribute, the nature of the mind. Prerequisite: Phil 203 or 226 or 426 or consent of the instructor.

**404. Philosophy of Science. 4 Hours.** Selected works on the aims and methods of science; the status of scientific theories, natural laws, and theoretical entities; the nature of scientific explanation. Prerequisites: Phil 102 or 210 and one 200-level course in philosophy, or consent of the instructor.

**406. Philosophy of Language. 4 Hours.** Intensive treatment of one or more topics, such as meaning and reference, communication, the structure of language, language and thought, and the relation of language to reality. Prerequisite: Phil 102 or one 200- or 400-level logic course or Phil 226 or consent of the instructor.

**410. Introduction to Formal Logic. 4 Hours.** Review of predicate logic and of introductory set theory. The concept of a formal system. Notions of completeness and soundness. Introduction to Gödel's first incompleteness theorem. Prerequisite: Phil 210 or consent of the instructor.

**416. Metalogic I. 4 Hours.** Students who have taken Math 430 may not register for this course. Should be taken in sequence with Phil 417. Metatheory for sentence and predicate logic. Completeness and compactness theorems and their applications. Prerequisite: Phil 210 or consent of the instructor.

**417. Metalogic II. 4 Hours.** Effective computability and recursive functions. Peano arithmetic. Arithmetization of syntax. Incompleteness and undecidability: Gödel's and Church's theorems. Prerequisite: Phil 416 or consent of the instructor.

**420. Plato. 4 Hours.** May be repeated once for credit with the consent of the department. Careful reading of selected works. Prerequisite: Phil 220 or 221 or 3 courses in philosophy or consent of the instructor.

**421. Aristotle. 4 Hours.** May be repeated once for credit with the consent of the department. Careful reading of selected works. Prerequisite: Phil 220 or 221 or 3 courses in philosophy or consent of the instructor.

**422. Medieval Philosophy. 4 Hours.** Study of selected philosophers such as Augustine, Boethius, Averroes, Maimonides, Aquinas, William of Ockham, Buridan, Suarez. Prerequisite: Phil 220, 221, 420, or 421 or consent of the instructor.

**423. Studies in Early Modern Philosophy. 4 Hours.** May be repeated once for credit with the consent of the department. Careful reading of selected works of one or more philosophers, 1600 to 1750, such as Descartes, Hobbes, Spinoza, Leibniz, Locke, Berkeley, Hume, Reid, and Rousseau. Prerequisite: Phil 223 or 224 or 3 courses in philosophy or consent of the instructor.

**424. Kant. 4 Hours.** Intensive study of Kant's metaphysics and theory of knowledge with main reading drawn from the Critique of Pure Reason. Prerequisite: Phil 223 or 224 or 3 courses in philosophy or consent of the instructor.

**425. Studies in Nineteenth-Century Philosophy. 4 Hours.** Careful reading of one or more post-Kantian philosophers such as Hegel, Schelling, Fichte, Schopenhauer, Marx, J.S. Mill, Kierkegaard, Nietzsche. Prerequisite: One 200-level course in philosophy or consent of the instructor.

**426. Analysis and Logical Empiricism. 4 Hours.**

Developments in twentieth century philosophy with roots in the study of logic and language, such as logical atomism, logical empiricism, and contemporary analytic philosophy. Topics vary. Prerequisite: Phil 210 or 226 or consent of the instructor.

**427. Continental Philosophy II: European Thought Since 1960. 4 Hours.** European thought since 1960: Existential Marxism; critical theory, structuralism; post-structuralism and deconstruction. Prerequisite: Phil 227 or consent of the instructor.

**429. Special Studies in the History of Philosophy. 4 Hours.** May be repeated once for credit with the consent of the department. Advanced study of a historical school, period, or the development of a historical theme. Prerequisite: One 200-level course in the history of philosophy or consent of the instructor.

**430. Ethics. 4 Hours.** May be repeated once for credit with the approval of the department. Selected topics in moral philosophy, such

as normative ethics, value theory or meta-ethics. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

**431. Social/Political Philosophy. 4 Hours.** May be repeated once for credit with consent of the department. Selected topics in social and political philosophy. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

**432. Topics in Ethics. 4 Hours.** May be repeated once for credit with the approval of the department. Selected topics in ethics. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social or political philosophy is recommended.

**433. Topics in Social/Political Philosophy. 4 Hours.** May be repeated once for credit with the approval of the department. Selected topics in social and political philosophy. Prerequisite: One 200 level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

**441. Topics in Philosophy of Religion. 4 Hours.** May be repeated once for credit with the approval of the Department. Intensive study of one or more selected topics concerning the philosophical aspects of basic religious beliefs and concepts. Prerequisite: One 200-level course in philosophy (Phil 241 is recommended) or consent of the instructor.

**500. Writing in Philosophy. 4 Hours.** Required of all first-year PhD students. Practice in philosophical writing including finding a thesis. Judicious choice of reading on the topic, outlining, and composing drafts as well as style, paragraphing, and making sentences. Prerequisite: Graduate standing in philosophy.

**501. Seminar: Topics in Ancient Philosophy. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**503. Medieval Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Intensive study of special topics in medieval philosophy.

**504. Theoretical Approaches to Policy and Governance. 4 Hours.** Same as PolS 504. Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based.

**505. Seminar in Modern Philosophy. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive analysis of the work of one important philosopher or philosophical movement between 1600 and 1900.

**508. Nineteenth-Century Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in nineteenth-century philosophy.

**509. History of Analytic Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term when topics vary. Topics in late nineteenth- and early twentieth-century Anglo-American philosophy.

**510. History of Ethics and Social/ Political Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Topics in the history of ethics or social-political philosophy.

**513. Topics in History of Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Philosophers, philosophical schools, or intellectual trends other than those of the ancient and modern periods.

**520. Topics in Contemporary Philosophy. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive analysis of the work of one important philosopher or philosophical movement of the twentieth century.

**522. Feminist Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in feminist Philosophy.

**524. Continental Philosophy. 4 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in continental philosophy.

**526. Ethics. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**528. Social/Political Philosophy. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**530. Aesthetics. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics in aesthetics.

**532. Metaphysics. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**534. Philosophy of Mind. 4 Hours.** May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**536. Epistemology. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Selected topics in the contemporary theory of knowledge.

**538. Philosophy of Language. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**540. Philosophy of Science. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

**542. Philosophy of Special Sciences. 4 Hours.** May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Intensive study of special topics in philosophy of physics, philosophy of biology, or other sciences.

**544. Philosophy of Logic. 4 Hours.** May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary.

**546. Philosophy of Mathematics. 4 Hours.** May be repeated for credit with the approval of the department. Philosophical foundations of mathematics.

**560. Recursion Theory I. 4 Hours.** Same as Math 500. Primitive recursion, recursive and recursively enumerable sets, the arithmetic hierarchy, post's problem and the finite injury priority method. Prerequisite: MCS 441.

**562. Metamathematics I. 4 Hours.** Same as Math 502. First order logic, completeness theorem and model theory. Prerequisite: Math 430 or consent of the instructor.

**563. Metamathematics II. 4 Hours.** Same as Math 503. Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. Prerequisite: Phil 562.

**565. Set Theory I. 4 Hours.** Same as Math 504. Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. Prerequisite: Math 430 or Phil 562.

**567. Model Theory I. 4 Hours.** Same as Math 506. Introduction to stability theory: categoricity, stability, forking, finite equivalence relation theorem, indiscernibles, orthogonality. Prerequisite: Phil 562.

**568. Model Theory II. 4 Hours.** Same as Math 507. Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. Prerequisite: Phil 567.

**569. Advanced Topics in Logic. 4 Hours.** Same as Math 512. Students may register for more than one section per term. Advanced topics in modern logic; e.g., descriptive set theory, model theory of fields, theory of hierarchies, stable groups. Prerequisite: Approval of the department.

**590. Research Seminar. 4 Hours.** May be repeated for credit. S/U grade only. A work-in-progress seminar for graduate students at the topical, prospectus, or dissertation level. Prerequisite: Completion of 10 of the 14 required courses for the PhD in Philosophy.

**593. Independent Research. 2 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Topics and plan of study must be approved by the candidate's advisor and by the staff member who directs the work.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Topics



and plan of study must be approved by the candidate's advisor and by the staff member who directs the work.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only.

## Physical Therapy (PT)

### **501. Science of Physical Therapy Practice. 3 Hours.**

Concepts of evidenced-based physical therapy practice including practice theory, measurement, outcomes assessment and critical evaluation of bodies of literature in context of the health care system and health policy. Prerequisite: Consent of the instructor.

### **502. Measuring Motor Development and Function. 3 Hours.**

Psychometric characteristics of standardized tests of motor development and function. Survey of tests, test evaluation, interpretation of test scores, and application to clinical practice. Prerequisites: Consent of the instructor and a graduate-level course in statistics.

### **503. Analysis of Motor Development. 3 Hours.**

Sensorimotor development in children, relating changes to maturation, skill acquisition, motor learning, environmental influences and individual differences. Includes critical review of current literature. Prerequisite: Consent of the instructor. Recommended background: Prior experience in or knowledge of child development.

### **504. Assessment of Developmental Processes in Infancy. 2 Hours.**

Motor and behavioral competencies of the newborn, both term and preterm. Assessment of behavior and motor dysfunction in infants; analysis of the literature on intervention. Prerequisites: Consent of the instructor and credit or concurrent registration in a graduate-level course in statistics.

### **510. Control of Posture and Locomotion. 2 Hours.**

Review and analysis of normal and developmental aspects, assessment, disorders, and rehabilitation of balance and gait disorders. Prerequisites: PT 562 and consent of the instructor.

**511. Therapeutic Intervention. 3 Hours.** Provides clinicians with an approach to integrate research into practice. The goal is to acquire skills to evaluate therapeutic interventions in the literature and in practice. Prerequisite: Consent of the instructor.

**520. Mechanics of Joint Dysfunction. 3 Hours.** Principles of mechanics applied to pathology of joint components; mechanical and neurological implications of extremity and spinal joint dysfunction; critical review of pertinent literature. Prerequisite: PT 519.

### **521. Biomechanics of Locomotor Dysfunction. 3 Hours.**

Principles of mechanics applied to the study of walking pattern. Kinematic and kinetic analysis of normal and pathological deviations, and issues related to development from birth to adult and neuromuscular control. Prerequisite: Consent of the instructor.

### **562. Neural Plasticity and Pathophysiology. 3 Hours.**

Previously listed as: PT 462. Neurologic concepts underlying PNS/CNS injury process and neural plasticity (nervous system remodeling and reorganization). Neuropathology of conditions producing movement dysfunction. Prerequisite: Consent of the instructor.

### **563. Measurement in Physical Therapy. 3 Hours.**

Previously listed as: PT 463. Measurement theory and statistics underlying the development of standardized tests. Critique of physical therapy tests of strength, ROM, coordination, endurance, and activities of daily living. Prerequisites: Consent of the instructor and any graduate-level statistics course.

### **570. Planning and Evaluating Intervention Programs in Various Settings. 3 Hours.**

Planning, implementation, and evaluation of services for children with special needs. Emphasis on conceptual frameworks in human development and family systems. Program planning and evaluation. Prerequisite: Consent of the instructor. Recommended background: Prior experience or knowledge of child development.

### **571. Biomechanics of Normal and Abnormal Movement. 3 Hours.**

Same as Kine 571. Previously listed as: PT 519. Principles of statics and dynamics exemplified by human movements. Examination of muscle mechanics, joint forces, stability. Redundancy and intersegmental interactions in multijoint movements. Prerequisites: Consent of the instructor.

### **572. Psychology of Motor Control and Learning. 3 Hours.**

Same as Kine 572. Advanced principles of the control and acquisition of complex, voluntary skills. Prerequisites: Kine 354 or consent of the instructor.

### **574. Instrumentation for Motor Control Research. 3 Hours.**

Same as Kine 574. Previously listed as: PT 522. Introduction to oscilloscopes, amplifiers, filters, and transducers. Origin and processing of electromyograms. Motion capture and processing techniques. Prerequisite: PT 571.

### **594. Special Topics in Physical Therapy. 1 to 4 Hours.**

May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Students may register for more than one section per term. Selected topics of interest within physical therapy specialty areas. Particular attention is given to topics of crosscutting importance to these professions, especially applications in teaching, consultation, and administration. Prerequisite: Consent of the instructor.

### **595. Seminar in Physical Therapy. 1 Hour. S/U grade only.**

Topics of current interest in physical therapy. Includes discussions of current research and important new developments in the specific disciplines. Prerequisite: Consent of the instructor.

### **596. Independent Study. 1 to 4 Hours.**

May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

### **598. Research in Physical Therapy. 0 to 16 Hours. S/U grade only.**

Independent research in one area of physical therapy directed by a faculty member. Prerequisites: Foundation courses in research methods and graduate-level statistics and consent of the instructor.

## Physics (Phys)

**401. Electromagnetism I. 4 Hours.** Vector calculus; electrostatic fields in vacuum; solution of electrostatic boundary-value problems; electrostatic fields in material media; electrostatic energy; electric currents. Prerequisites: Phys 142 and 215.

**402. Electromagnetism II. 4 Hours.** Magnetic fields of steady currents and magnetic materials; electromagnetic induction; magnetic energy; slowly-varying currents; a-c circuits; Maxwell's equations; electromagnetic waves; bounded regions; special relativity. Prerequisite: Phys 401.

**411. Quantum Mechanics I. 4 Hours.** Wave particle duality; wave functions; Schroedinger equation; mathematical structure of quantum mechanics; operators and observables; matrix representation of operators; three-dimensional Schroedinger equation. Prerequisite: Phys 244.

**412. Quantum Mechanics II. 4 Hours.** Orbital angular momentum. Spin and vector addition of angular momenta; degenerate and nondegenerate perturbation theory; identical particles; time-dependent perturbation theory; scattering theory. Prerequisite: Phys 411.

### **421. Modern Physics: Atoms and Molecules. 4 Hours.**

Hydrogenic atoms, electron spin, external fields, multi-electron atoms, diatomic molecules, line widths, photons, radiation from atoms and other electromagnetic processes, positrons, positronium, elastic electron scattering. Prerequisite: Credit or concurrent registration in Phys 411.

### **425. Modern Optics. 5 Hours.**

Review of electromagnetic wave theory; advanced geometrical optics; Fourier transforms and optics; interference and diffraction; laser cavities and gain media; introduction to nonlinear and fiber optics. Prerequisite: Phys 244.

### **429. Plasma. 4 Hours.**

Same as ECE 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to kinetic theory. Prerequisite: ECE 322.

### **431. Modern Physics: Condensed Matter. 4 Hours.**

Crystal structures; interatomic binding; lattice vibrations; thermal and magnetic properties; quantum statistical mechanics; free electron theory of metals; electronic band theory; semiconductors and insulators; superconductivity. Prerequisites: Phys 411 and 461; or consent of the instructor.

### **441. Theoretical Mechanics. 4 Hours.**

Variable motion, non-inertial frames, oscillations, rigid body motion, three-dimensional motion, angular momentum, torque, orbits, Lagrange's equations. Prerequisites: Phys 142 and 215.

### **450. Molecular Biophysics of the Cell. 4 Hours.**

Introduction to molecular length, time, force, energy scales; statistical thermodynamics of solutions; DNA, RNA and protein structure and function; experimental methods; cell membranes; protein motors; energy and information flow; prokaryote cell; eukaryote cell. Prerequisite: Phys 245 or the equivalent.

**451. Modern Physics: Nuclei and Elementary Particles. 4 Hours.** Accelerators, detectors, symmetries, conservation laws, leptons, weak interactions, electroweak theory, strong interactions, hadrons, nuclear forces, systematics and reactions, nuclear models, nuclear astrophysics, quarks, quantum chromodynamics. Prerequisite: Phys 411.

**461. Thermal and Statistical Physics. 4 Hours.** Thermal equilibrium (Zeroth Law); thermodynamic states (First Law); irreversibility; entropy (Second Law); thermodynamic potentials and properties; phase transitions; kinetic theory of gases; classical statistical mechanics. Prerequisite: Phys 245.

**470. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**471. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Phys 470, and approval of the department.

**481. Modern Experimental Physics I. 4 Hours.** Theory and experimental use of linear circuits, semiconductor devices, amplifiers, oscillators. Techniques and experiments in atomic, molecular and solid-state physics. Prerequisite: Phys 244.

**482. Modern Experimental Physics II. 4 Hours.** Techniques and experiments in nuclear and particle physics. Gamma-gamma correlations, muon lifetime, Compton scattering, alpha particle scattering. Computer-based experimentation. Prerequisite: Phys 481.

**494. Special Topics in Physics Teaching. 2 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Seminar on various topics related to the teaching of physics. Supervised practice. Subjects are announced.

**499. Survey of Physics Problems. 1 Hour.** May be repeated once for credit. No graduation credit for graduate students. Problem-solving techniques applied to the variety of undergraduate physics topics. Prerequisites: Credit or concurrent registration in Phys 401, 411, 441, 461, and 481.

**501. Electrodynamics I. 4 Hours.** Maxwell's equations, static and time-dependent fields in material media and in vacuo. Boundary value problems, wave propagation. Classical theory of radiation. Prerequisite: Phys 402 or consent of the department.

**502. Electrodynamics II. 4 Hours.** Special relativity in electrodynamics. Covariant form of Maxwell's equations. Lagrangian form of electrodynamics. Applications to modern physics problems. Prerequisite: Phys 501 or consent of the department.

**511. Quantum Mechanics I. 4 Hours.** Linear operators, vector spaces. Schroedinger equation. Heisenberg formalism. Multi/identical particle systems, approximation methods, perturbation theory, symmetries and groups, conservation laws, angular momentum, spin. Wigner-Eckart theorem. Prerequisite: Phys 412 or consent of the department.

**512. Quantum Mechanics II. 4 Hours.** Scattering theory, partial waves, Born approximation, density matrix, interaction of radiation with matter; Klein-Gordon and Dirac equations, free-particle solutions, antiparticles, relativistic hydrogen atom. Second quantization. Prerequisite: Phys 511 or consent of the department.

**513. Quantum Field Theory I. 3 Hours.** Lagrangian formulation of relativistic wave equations. Quantum electrodynamics: Feynman rules, trace theorems, lowest-order calculations for several processes, self-energy, renormalization, higher-order diagrams. Prerequisite: Phys 512.

**514. Quantum Field Theory II. 3 Hours.** Path integrals, gauge theories, Weinberg-Salam model, electroweak processes, quantum chromodynamics, non-perturbative methods, topological objects in field theories, instantons. Prerequisite: Phys 513.

**515. Methods in Mathematical Physics. 3 Hours.** Applications of mathematical methods to physics problems, linear operators, orthogonal functions, Green's functions, ordinary and partial

differential equations, Sturm-Liouville problem, Hilbert space, group theory. Prerequisite: Phys 215.

**521. Molecular Physics. 3 Hours.** Rotational and vibrational energies of molecules, potential curves, electronic transitions, transition moments, intensity rules, thermodynamic properties. Applications. Prerequisites: Phys 411 and 421 or consent of the department.

**522. Laser Physics/Quantum Electronics. 3 Hours.** Laser physics; population inversion; quantum theoretical calculation; modern laser systems; coherence phenomena; applications of lasers. Prerequisite: Phys 521 or approval of the department.

**524. Group Theory in Physics. 3 Hours.** Applications of group theory and symmetry principles to problems in elementary particle, solid-state, atomic and molecular physics. Prerequisite: Phys 512 or consent of the department.

**531. Solid State Physics I. 3 Hours.** Crystal structure, reciprocal lattice, X-ray methods, crystal forces, phonons, heat capacity, thermal expansion. Classification of solids, band structure. Metals: free-electron model, band-structure effects, transport. Prerequisites: Phys 412 and 461.

**532. Solid State Physics II. 3 Hours.** Semiconductor physics, electron-electron and electron-phonon interactions, superconductivity, spin systems, diamagnetism, paramagnetism, ferromagnetism and antiferromagnetism. Prerequisite: Phys 531.

**533. Theory of Solids: Magnetism and Superconductivity. 3 Hours.** The main body problem; many-particle states; functional integrals; Green's functions; Feynman diagrams; perturbation expansions; tree diagrams. Prerequisites: Phys 512 and 532.

**534. Theory of Solids: Semiconductor Physics. 3 Hours.** Spin systems; magnetism; equilibrium Green's functions; Landau theory of fermi liquids; Hubbard model; Luttinger model; non-equilibrium Green's functions; Keldysh; Kadanoff-Baym approach. Prerequisites: Phys 512 and 532.

**540. Physics of Semiconductor Devices. 4 Hours.** Same as ECE 540. Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions, in homogeneous semiconductors; recombination and generation; non-equilibrium processes, radiation and electric fields; diodes. Prerequisite: ECE 346 or the equivalent.

**541. Theoretical Mechanics. 3 Hours.** Variational principles; Lagrange and Hamilton equations; Hamilton-Jacobi theory; Poisson brackets, small oscillations; continuous systems and fields; dissipative systems; integrability. Prerequisite: Phys 442 or consent of the department.

**545. Introduction to General Relativity. 3 Hours.** Principle of equivalence, the metric field and geodesics, tensor analysis and differential geometry, Einstein's equations and the action principle, gravitational fields and waves, black holes. Prerequisites: Phys 502 and 541, or consent of the department.

**551. Elementary Particle Physics I. 3 Hours.** Phenomenology and theories of modern day particle physics. Classification of particles and their interactions. Survey of experimental techniques, accelerators and detectors. Prerequisite: Phys 512 or consent of the department.

**552. Elementary Particle Physics II. 3 Hours.** Lagrangian formulation of electromagnetic, weak and strong interactions. Transition rates. Unification of electroweak and strong interactions. Gauge theories. Modern topics. Prerequisite: Phys 551 or consent of the department.

**561. Statistical Mechanics. 3 Hours.** Density matrix. Information theory; Boltzmann-Gibbs distributions; the n-vector model; renormalization group theory; cellular automata. Prerequisite: Phys 461 or consent of the department.

**581. Advanced Experimental Physics. 2 Hours.** Experimental techniques in atomic, molecular and solid-state physics. Prerequisite: Phys 431 or consent of the instructor.

**594. Special Topics in Modern Physics. 1 to 4 Hours.** Students may register for more than one section per term. Lectures on topics of current interest. Subjects are announced in the previous semester. Prerequisite: Phys 512.

**595. Graduate Seminar. 2 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. S/U grade only. Seminars in areas of research activity within the department, covering recent contributions to the literature and

research in progress. Presentations by students, faculty and scientists from other institutions.

**596. Individual Study. 2 to 4 Hours.** S/U grade only. Students may register for more than one section per term. Special topics. Outside reading and a term paper are assigned by a special arrangement with the department and faculty. Prerequisite: Consent of the department.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. Student may elect to do thesis research to fulfill partial requirement for master's degree. Prerequisite: Consent of the department.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Prerequisite: Consent of the department.

## Physiology and Biophysics (PhyB)

**401. Human Physiology I. 5 Hours.** Lectures and conferences in human physiology. Emphasis is on cellular, nerve-muscle, cardiovascular, respiratory, and renal physiology. Prerequisites: Mathematics, undergraduate physics, and organic chemistry, and concurrent registration in graduate biochemistry, or consent of the instructor.

**402. Human Physiology II. 5 Hours.** Continuation of PhyB 401. Emphasizes gastrointestinal and physiology of the central nervous system, endocrine and reproductive systems. Prerequisite: A grade of C or better in PhyB 401 or consent of the instructor.

**410. Principles of Physiology. 4 Hours.** Covers physiological principles and their application to clinical practice. Prerequisites: Undergraduate physics, and organic chemistry.

**501. Endocrinology. 3 Hours.** Review of the field of endocrinology will be followed by a systematic consideration of new concepts in endocrine gland and mechanism of hormone action. Attention will be paid to the most important areas of research being pursued at present. Prerequisite: PhyB 402 or consent of the instructor.

**502. Physiology of Reproduction. 2 Hours.** The purpose of this course is to enable students to acquire a detailed and up-to-date understanding of the biology of reproduction at both the physiological and molecular levels.

**505. Advanced Topics in Receptor Pharmacology and Physiology. 2 Hours.** Same as Pcol 505. Lecture/discussions of theoretical and experimental aspects of neurotransmitter, hormone and drug interactions with tissue receptors. Topics include drug receptor theory and signal transduction mechanisms. Prerequisite: Bche 460.

**512. Gastrointestinal Physiology. 2 Hours.** Advanced study of the physiology of the gastrointestinal tract. Special emphasis will be placed on recent developments in cellular and molecular aspects and on how they relate to established concepts in the literature. Prerequisite: PhyB 402 or consent of the instructor.

**516. Physiology and Biochemistry of Muscle Contraction. 2 Hours.** Same as Bche 516. Structure and function of myosin, actin, tropomyosin, troponin, and the sarcoplasmic reticulum; control, energetics, and mechanism of muscle contraction; gene expression.

**518. Molecular, Cellular, and Integrative Cardiovascular Physiology. 3 Hours.** Advanced study of the cardiovascular system from molecule to organism. Emphasis on recent developments at the molecular/cellular level and their relationship to overall function. Prerequisite: PhyB 401 or consent of the instructor.

**523. Exercise Biology in Health and Disease. 3 Hours.** Same as Kine 523. Interrelationships between exercise and various pathological conditions. Current research focusing on molecular and cellular mechanisms in healthy and diseased states. Prerequisite: Consent of the instructor.

**524. Exercise Physiology: Training Adaptations and Mechanisms. 3 Hours.** Same as Kine 524. Metabolic, endocrine, circulatory, respiratory, and molecular biology alterations that occur in response to exercise. Prerequisite: Consent of the instructor.

**525. Exercise Physiology: Hormonal Implications. 2 Hours.** Same as Kine 525. Relationship of endocrine system to anatomical, physiological, and biochemical alterations that occur in response to exercise; a mechanistic approach. Prerequisite: Consent of the instructor.

**531. Molecular Biophysics. 2 Hours.** Structural and dynamical studies of biomolecules by means of biophysical techniques. Prerequisites: One year each of college chemistry, physics, and quantum mechanics, or consent of the instructor.

**532. Nuclear Magnetic Resonance. 2 Hours.** An introduction to the principles of analysis of structure and dynamic properties of biomolecules by means of nuclear magnetic resonance (NMR) spectroscopy. Fundamentals of NMR theory. Prerequisites: One year each of college chemistry, physics, mathematics, and quantum mechanics or consent of the instructor.

**533. Nuclear Magnetic Resonance in Biophysics. 2 Hours.** Continuation of PhyB 532. Analysis of structure and dynamics of biomolecules in vitro and in vivo by means of nuclear magnetic resonance spectroscopy. Prerequisite: PhyB 532 or consent of the instructor.

**544. Renal Physiology. 2 Hours.** Renal physiology, regulation of body fluid balance, acid-base balance, renal tubular transport. Prerequisite: PhyB 402 or consent of the instructor.

**569. Methods in Experimental Physiology. 3 Hours.** Primarily for students in physiology. Registration limited to eight. A laboratory course designed to acquaint students with advanced techniques and methodology in physiologic investigations. Prerequisites: Enrollment in the MS or PhD in Physiology and Biophysics program, and credit or concurrent registration in PhyB 401 or the equivalent, or consent of the instructor.

**585. Cell Biology. 4 Hours.** Same as Anat 585 and MIm 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

**586. Cell Physiology I. 4 Hours.** Advanced functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Prerequisite: PhyB 402 and 585 and Bche 460, or consent of the instructor.

**588. Membrane Biochemistry and Biophysics I. 2 Hours.** Discussion of the physical and chemical properties of biological membranes and how they relate to their function as barriers capable of transporting water, electrolytes, solutes and macromolecules. Prerequisites: PhyB 402 and Bche 460.

**589. Membrane Biochemistry and Biophysics II. 2 Hours.** Continuation of PhyB 588. Relation of the properties of biological membranes to their function in specialized systems. Prerequisite: PhyB 588.

**591. Departmental Seminar. 1 Hour.** May be repeated for credit. S/U grade only. Required of all physiology and biophysics students each fall and spring semester while enrolled in the graduate program. Weekly seminar by staff and invited speakers. Prerequisite: Graduate or professional standing.

**592. Tactics and Strategy of Research in Physiology. 2 Hours.** Course presents an analysis concerning various approaches in solving current physiology problems. Emphasizes critical reading of the literature. Prerequisite: PhyB 401.

**594. Special Topics in Physiology and Biophysics. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Topics may include bioengineering, endocrinology, membrane biology, ion transport and its regulation, muscle physiology, neurophysiology, molecular neurobiology and others of current significance in physiology and biophysics. Prerequisite: Consent of the instructor.

**595. Journal Club and Seminar in Physiology. 1 Hour.** S/U grade only. Student presentation and discussion of assigned topics of current importance in physiology and biophysics as well as related fields. Prerequisites: Consent of the instructor. Limited to degree candidates in physiology and biophysics.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Individual study guided by a faculty member. The format of the course, examination and grading to be established by the faculty member. Prerequisite: Consent of the instructor.

**598. MS Thesis Research. 0 to 16 Hours.** S/U grade only. Thesis work under the supervision of a graduate advisor. Prerequisite: Graduate standing in Physiology and Biophysics.

**599. Thesis Research. 0 to 16 Hours.** S/U grade only. Thesis work under the supervision of a graduate advisor.

## Policy Studies (PS)

**406. Politics of Urban Education. 4 Hours.** Same as PolS 440. Relations between school governance and urban politics. The role of educational interest groups, school boards, professional educators, and citizens in formulation and execution of educational policy.



**453. Topics in Education Policy. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Workshop; emphasis on issues related to school organization, control and community relations. Topics are announced at the time the class is scheduled.

**501. School Finance and Policy Analysis. 4 Hours.** Concepts of school finance, taxation, resource allocation. Role of governments in support of education. Fundamentals of program budgeting and systems analysis techniques in educational planning. Prerequisite: Consent of the instructor.

**510. Seminar in Urban Education. 4 Hours.** S/U grade only. This required doctoral seminar will be taken in the first year of doctoral study. It introduces theoretical perspectives and research problems in both concentrations of the PhD program as well as relation between educational and social changes. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

**512. The Nature and Interpretation of Evidence in Educational Policy Research. 4 Hours.** This required course in educational research methodology provides students with basic research tools and skills in interpreting and representing quantitative and qualitative data. Students learn research design and critique. Prerequisites: Ed 500 and enrollment in the PhD in Policy Studies in Urban Education program or consent of the instructor.

**535. Leadership and Educational Supervision. 4 Hours.** Same as CIE 551. Theory and practice of supervisory leadership in educational settings; effects of interactive factors on performance assessment and professional development. Field experience requirement. Prerequisite: Ed 430 or 431, or consent of the instructor.

**540. Administration of Student Personnel Services. 4 Hours.** Administrator support roles and responsibility for pupil personnel services; school-community relations and guidance services.

**542. The Counseling Process. 4 Hours.** Nature, functions, and goals of counseling in urban schools. Theories with applications for school and agency counseling, and related problems and issues. Prerequisite: PS 540.

**550. Foundations of School Administration. 4 Hours.** Administrative and legal roles and relations in policy development and execution. Influences of governmental and private organizations. Prerequisite: Consent of the instructor.

**551. Administration Problems in Urban Schools. 4 Hours.** The urban school system as a bureaucracy and cooperative social system. Analysis of central, district and local school decision-making. Case studies in problem solving. Prerequisite: Consent of the instructor.

**552. The School Principalship. 4 Hours.** Leadership and management responsibilities of principals in metropolitan schools. Focus on theory, research on principals, case studies, and field encounters with working principals. Prerequisite: PS 550.

**554. Administering Effective Schools. 4 Hours.** Administrative responsibility for school effectiveness; research-based strategies for improving classroom learning environments; techniques of staff development; personnel and program evaluation. Prerequisite: PS 552.

**556. Administrative Issues in Instructional Leadership. 4 Hours.** The instructional improvement role of the school administrator. Focuses upon opportunities and constraints in facilitating student learning, teacher professionalism, curriculum development, and parent involvement. Prerequisite: PS 550 or consent of the instructor.

**559. Internship in School Administration. 4 Hours.** Field experience in administration. Students apply administration skills and concepts learned in class to a project pursued in a field setting. Prerequisite: Completion of all master's degree course requirements.

**560. Administration of Programs for Students with Disabilities. 4 Hours.** Same as SpEd 560. Alternative administrative arrangements for students with disabilities in schools. Analysis of current legislation, funding, inservice training, and needs and rights of children and parents. Prerequisite: SpEd 410 and CIE 551; or consent of the instructor.

**566. Cultural Studies in Education. 4 Hours.** This course will examine origins, evolutions, and current cultural studies frameworks, with a focus on educational policy and practice. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

**567. Economics of Education and Public Policy: An Introduction. 4 Hours.** Introduction to the economics of

education. It relates education and income, studies and conditions for efficient production of education, teacher markets and school finance. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

**568. Education and the Law. 4 Hours.** Legal rights, privileges, responsibilities, immunities, and authority of pupils, parents, teachers, administrators, school boards, and governmental units in relation to the school. Prerequisite: PS 550 or consent of the instructor.

**570. Educational Policy: Historical and Philosophical Analysis. 4 Hours.** The evolution of American educational thought and policy in the context of social and intellectual developments in the culture of the United States. Prerequisite: Consent of the instructor.

**571. Education Policy: Formation, Implementation, Outcomes. 4 Hours.** Examination of social forces outside the school that influence educational policy making, and the results of implementing policy decisions: legislatures, courts, government agencies, interest groups. Prerequisite: Consent of the instructor.

**572. Sociology of Education. 4 Hours.** Same as Soc 572. Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education, inequality and educational reform. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

**573. Seminar on Administrative Practice in Education. 4 Hours.** Direct case analyses of major topics in the practice of school administration, including collective bargaining, finance, planning, community relations, bilingual and special education, and student services. Prerequisite: PS 550 or consent of the instructor.

**574. The Impact of College on Students. 4 Hours.** Same as PPA 574. Introduction to the research evidence on the impact of college on students. Emphasis is placed on methods of assessing impact and research on college effects. Prerequisite: Consent of the instructor.

**575. Higher Education Organization and Administration. 4 Hours.** Same as PPA 575. Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. Prerequisite: Admission to the PhD in Public Policy Analysis program or consent of the instructor.

**576. History of Higher Education. 4 Hours.** Same as PPA 576. Key historical events that have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. Prerequisite: Admission to the PhD in Public Policy Analysis program or consent of the instructor.

**577. American Academic Profession. 4 Hours.** Same as PPA 577. Historical and systemic foundations of the academic profession. Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. Prerequisites: Admission to the PhD in Public Policy Analysis program and consent of the instructor.

**578. Theoretical Frameworks of Educational Politics. 4 Hours.** Basic concepts, hypotheses, research findings and theory development. Nature and function of theory in educational politics at the federal, state and local levels. Prerequisite: PS 406 or consent of the instructor.

**579. Organization and Management in Education. 4 Hours.** Models of decision making, organizational effectiveness, and organizational improvement in education. Topical problems in current educational management practice. Prerequisite: PS 550 or consent of the instructor.

**581. Collective Bargaining Policy in Education. 4 Hours.** Analysis of collective bargaining case studies and agreement with emphasis on implications for education policy formulation. Prerequisite: Consent of the instructor.

**582. Cultural Pluralism and Education Policy. 4 Hours.** Social philosophical analysis of the theory of cultural pluralism, emphasizing its relation to the liberal-experimentalist tradition in educational thought; selected equal educational opportunity policies; recent federal and state legislation on multicultural education. Prerequisite: Consent of the instructor.

**583. Women in Education. 4 Hours.** Same as GWS 583. An overview of girl's and women's educational experiences and placement sThe impact of gender on the realization of educational, economic and social opportunities. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

**587. Topics in Documentary and Field Research in Education. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Study and practice in documentary and field research methods of collecting, organizing and integrating educational data: interviewing, participant observation, ethnography, case study, historiography. Topics vary. Prerequisite: Consent of the instructor.

**588. Critical Race Theory: Race and Racism in Education. 4 Hours.** Examines theories of race and racism in education within the interdisciplinary construct of Critical Race Theory. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

**589. Educational Administration Theory. 4 Hours.** Overview of administrative theory including theory functions; theory-practice interface; administrative theory history; and relationships of administrative theory to educational administration and organizations. Prerequisite: PS 550 or consent of the instructor.

**592. Professional Career Training in Education Policy. 4 Hours.** May be repeated for a maximum of 16 hours of credit. Faculty-supervised training through university teaching, research or internship. Presentation relating experience to theory. Prerequisite: Consent of the instructor.

**593. PhD Research Project. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the PhD in Education program.

**594. Special Topics in Educational Policy. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Exploration of an area not covered in existing course offerings. Topics vary. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 4 Hours.** May be repeated for up to 12 hours of credit. Students may register for more than one section per term. Students carry out independent study in policy studies under the direction of a faculty member. Prerequisites: Consent of the advisor and the area chairperson.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student's dissertation. Prerequisite: Consent of the dissertation advisor.

## Polish (Pol)

**401. Polish Composition and Conversation III. 4 Hours.** Development of oral and writing skills: expanding vocabulary and perfecting style. Prerequisite: Pol 302.

**402. Polish Composition and Conversation IV. 4 Hours.** Continues Pol 401. Prerequisite: Pol 401 or the equivalent.

**410. Structure of Modern Polish. 4 Hours.** A synchronic linguistic analysis of Polish substantives, pronouns, verbs, deverbal nouns, and minor parts of speech from a syntagmatic and paradigmatic point of view. Prerequisite: Pol 402 or the equivalent.

**450. Studies in Polish Drama. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Main trends in Polish drama, leading playwrights, their aesthetics and philosophy in the context of European drama and from the Renaissance to the present.

**460. Studies in Polish Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Literary trends in Polish poetry and prose; their poetics, aesthetics, and philosophy in their European context.

**499. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

**510. History of the Polish Language. 4 Hours.** Phonological and morphological development; emphasis on lexical, syntactical, and stylistic problems. Linguistic analysis of selected texts. Prerequisite: Pol 410 or the equivalent.

**515. Topics in Contemporary Polish Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content.

**520. Topics in Historical Polish Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content.

**545. Studies in Polish Medieval, Renaissance, and Baroque Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, genre, author or movement. Content varies.

**550. Studies in Polish Enlightenment and Romanticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre or movement. Content varies.

**560. Studies in Polish Positivism and Symbolism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre, or movement. Content varies.

**565. Studies in Twentieth-Century Polish Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre, or movement. Content varies.

**570. Studies in Polish Literary Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Literary criticism in the major epochs of Polish literary history.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

## Political Science (PoIS)

**401. Data Analysis I. 4 Hours.** Same as PPA 401. Statistical inference for the social sciences. Emphasis on univariate and bivariate statistics.

**405. The Problem of Justice. 4 Hours.** Same as CrJ 405. Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. Prerequisites: CrJ 101 plus two 200-level courses in criminal justice or two 200-level courses in political science.

**414. Formal Models of Politics. 4 Hours.** Introduction to formal political theory, emphasizing spatial voting and collective action models, analytic techniques including game theory, decision theory, utility maximization, and difference equations.

**420. Administrative Theory and Behavior I. 4 Hours.** Theories of modern administrative behavior and organizational processes; major trends in research findings on organizational behavior and performance; comparison of governmental and nongovernmental organization. Prerequisite: PoIS 460 or consent of the instructor.

**425. Administrative Theory and Behavior II. 4 Hours.** In-depth study of selected theoretical problems in administrative organizations; emphasis on political contexts and policy implications. Prerequisite: PoIS 460 or consent of the instructor.

**429. Policy Making and Implementation. 4 Hours.** How political factors, institutional setting, procedures, and the prior experiences of government officials affect policy making and implementation. Prerequisite: PoIS 460 or consent of the instructor.

**435. Special Topics in Bureaucracy. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Consideration of timely or enduring issues in policy formation and bureaucracy not available in regularly offered courses. Prerequisites: PoIS 460 and consent of the instructor.

**440. Politics of Urban Education. 4 Hours.** Same as PS 406. Relations between school governance and urban politics. The role of educational interest groups, school boards, professional educators, and citizens in formulation and execution of educational policy.

**451. Law and Public Policy. 4 Hours.** The role of law and legal institutions in the development and implementation of public policies.

**460. The Structure and Processes of American Public Policy. 4 Hours.** Integrated overview of American policy-making institutions and processes. Emphasis on organizational design-making and the impacts of various policy-making institutions. Prerequisite: Consent of the instructor.

**465. Topics in the Sociology of Politics. 4 Hours.** Same as Soc 465. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is

scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**467. Public Opinion and Political Communication. 4 Hours.** Same as Comm 467. Nature of public opinion and political communication systems. Patterns of opinion distribution and its measurement. Forces shaping public opinion and its impact on public policy. Prerequisite: PolS 200 or the equivalent or consent of the instructor.

**472. Global Political Economy. 4 Hours.** Exploration of competing perspectives on nation states and economic systems.

**482. Democratic Theory. 4 Hours.** Democracy as a procedure of government and value commitments associated with this form of government. Special attention paid to classical and modern democracies. Prerequisite: PolS 290 or 291, or consent of the instructor.

**485. Gender and Politics. 4 Hours.** Same as WS 485. Impact of gender on basic categories of western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. Prerequisites: PolS 190 and one 200-level course in political theory, or consent of the instructor.

**486. Political Violence. 4 Hours.** Use or threat of violence in the political process. Emphasis on major theories of internal violence in various nations viewed both cross-culturally and longitudinally. Prerequisites: PolS 101 and one other course in the social sciences, or consent of the instructor.

**497. Directed Readings in Political Science. 4 Hours.** May be repeated for credit with consent of the graduate director. Intensive readings on a topic not covered in the regular curriculum. Prerequisite: Consent of the instructor.

**498. Independent Research in Political Science. 2 to 6 Hours.** May be repeated for credit with consent of the graduate director. May not duplicate work done in PolS 598 or 599. Research on special problems not included in course offerings. Prerequisite: Consent of the instructor.

**500. Introduction to Policy and Governance. 4 Hours.** Same as PPA 500. Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored.

**501. Data Analysis II. 4 Hours.** Same as PPA 501. Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. Prerequisite: PolS 401.

**502. Time Series Analysis for Political Science. 4 Hours.** Single series (ARIMA) models, event history analysis, Vector autoregression (VAR), panel and pooled models. Prerequisite: PolS 402 or consent of the instructor.

**503. Structural Equation Modeling for Political Science. 4 Hours.** Systems of equations, structural models, maximum likelihood estimation, LISREL, matrix algebra, GAUSS. Prerequisite: PolS 402 or consent of the instructor.

**504. Theoretical Approaches to Policy and Governance. 4 Hours.** Same as Phil 504. Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based.

**505. Research Design and Methods. 4 Hours.** Overview of the methods and conduct of research in political science. Issues of inference, measurements, data collection, hypothesis testing and ethics.

**506. The Profession of Political Science. 2 Hours.** S/U grade only. Introduces graduate students to the range of teaching, research and service possibilities in the political science profession. Students are encouraged to take this course during their first year of graduate study.

**510. Seminar on Teaching Political Science. 2 Hours.** S/U grade only. Seminar on ethics and responsibilities of teaching political science in various academic settings. Teaching methods and technology applicable to community colleges and four-year colleges are explored. This course complements the Preparing Future Faculty Program. The format will include guest speakers from area community and four-year colleges.

**536. Public Personnel Systems. 4 Hours.** Major problems and issues in the management of human resources in the public sector. Prerequisite: PolS 541 or consent of the instructor.

**537. The Legal Environment of Public Administration. 4 Hours.** Statutory framework for administrative action; rule-making

and adjudicative powers of public agencies; judicial review of administrative action; liability of public officials. Prerequisite: PolS 541 or consent of the instructor.

**538. Public Budgeting and Evaluation. 4 Hours.** Processes and methods of budgeting and program evaluation in public sector organizations. Analytical techniques, political influences, and budgetary reforms. Prerequisite: PolS 541 or consent of the instructor.

**541. Policy Formation, Implementation, and Evaluation. 4 Hours.** Same as PPA 541. Introduction to political science theories of how elections, interest groups and state structure affect the formulation of public solutions to societal problems.

**542. Distributive/Redistributive Public Policy. 4 Hours.** Seminar on the politics of enacting and maintaining distributive policies. Focus is on the parochial and community-wide efficiency of such policies.

**544. Regulatory Public Policies. 4 Hours.** Exploring the nature and determinants of public policymaking with respect to the regulation of the economy.

**549. Topics in Public Policy Analysis. 4 Hours.** A research seminar on some aspects of public policy analysis not otherwise covered in the regular curriculum.

**551. Introduction to Urban Politics. 4 Hours.** Explores relationships between private economy and public policies in American cities; causes of urban decline and uneven development; and urban redevelopment and human capital policies.

**553. Urban Public Policy. 4 Hours.** Explores the problems of poverty, race, education, transportation policy, and housing in America's cities, with a special emphasis on Chicago.

**556. Neighborhood and Community Politics. 4 Hours.** The techniques and effects of community organizing. Major issues include the definition of community and how to encourage positive development. Prerequisite: PolS 551.

**558. Graduate Student Field Experience in Political Science. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Graduate student intern experience. Placement with government agencies, community organizations, or civic organizations, in conjunction with a seminar class and directed readings. Prerequisites: PolS 402 and 500.

**559. Topics in State and Local Government. 4 Hours.** Case analysis and research in selected problems dealing with structure, functions and administrative processes of American state and local governments. Prerequisites: PolS 500 and 541.

**562. Seminar on Legislation and Public Policy. 4 Hours.** Review of recent theories and research on structure and policy formation in American legislatures. Emphasis on theoretical development in this field. Prerequisite: PolS 541.

**563. Executive Process. 4 Hours.** Presidential elections; presidential decision-making; the powers of the president; presidential leadership; the distributive state; policy implementation; federalism and administration; the politics of budgeting. Prerequisite: Admission to the M.A. or PPA programs or consent of the instructor.

**564. Seminar in Judicial Process. 4 Hours.** The judicial process, as part of political and policy processes. Demands made by, and policy impacts on, individual and organizational litigants and other political actors. Prerequisite: PolS 460.

**566. Interest Groups. 4 Hours.** Pluralism: the distributive state; radical group theory, public-interest groups; collective actions; corporatism; statism; structural Marxism; social movements and interest groups.

**567. Topics in Political Communication. 4 Hours.** Same as Comm 567. Intensive study of selected aspects; organizational communication in public institutions, urban political communication patterns, communication elites. Independent research using a variety of community research techniques. Prerequisite: Consent of the instructor.

**569. Topics in American Political Processes. 4 Hours.** A research seminar on some aspect of American political process. Topics vary. Prerequisites: PolS 402 and 500.

**570. Comparative Politics and Public Policy. 4 Hours.** Comparative analysis of how different political systems deal with a variety of public policy issues such as environmental protection, social welfare and crime control.



**571. Seminar in International Relations. 4 Hours.**

Previously listed as: PolS 471. State-building and challenges to state authority, democratization and regime change, political economy, environment, war, regionalism and globalization, social movements and international governance.

**573. Transitions to Democracy. 4 Hours.** Game-theoretic view of democracy. Process and outcomes of transitions to democracy in capitalist and in communist countries. Civil-military relations in the process of transition. Case studies.

**579. Topics in Comparative Politics. 4 Hours.** Advanced seminar on selected topics in comparative politics. Topic(s) will vary from semester to semester. Prerequisites: PolS 500 and 541.

**582. The Philosophy of the Social Sciences. 4 Hours.**

The ontological and epistemological foundations of alternative approaches to the study of human beings. Naturalistic, hermeneutic, and critical approaches are addressed and assessed.

**589. Topics in Political Theory. 4 Hours.** Detailed analysis of a political theorist or type of political theory, especially designed to meet programmatic and graduate needs.

**590. Advanced Public Policy Workshop. 4 Hours.** Same as PPA 590. Interdisciplinary workshop on preparing a dissertation proposal for PPA students. Prerequisites: Advanced standing in the PPA program and completion of PPA core courses.

**596. Advanced Readings in Political Science. 1 to 4 Hours.**

May be repeated for credit with consent of the graduate director. Students may register for more than one section per term. Intensive readings on an advanced topic not covered in the regular curriculum. Prerequisites: PolS 401 and PolS 404 and consent of the instructor.

**598. Thesis Research. 0 to 16 Hours.** S/U grade only. Open only to degree candidates. Individual study required of all students pursuing advanced degree in political science under thesis option. Prerequisite: Consent of the instructor.

**599. Dissertation Research. 0 to 16 Hours.** S/U grade only. Open only to degree candidates. Individual study required of all students pursuing PhD degree with specialization in political science. Prerequisite: Consent of the instructor.

## Prosthodontics (Pros)

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**504. Advanced Dental Materials. 3 Hours.** A seminar course designed to develop an advanced understanding of dental materials and a fundamental knowledge of materials science. Involves a critical evaluation of the literature. Prerequisites: Rest 320, 321, 322, 323, and 330, or equivalent coursework, or matriculation into the Advanced Certificate in Advanced Prosthodontics program.

**517. Advanced Occlusion/TMJ Disorders. 2 Hours.** A lecture and seminar discussion of the advanced concepts of occlusion, articulation, occlusal analysis, diagnosis, and treatment of functional disturbances. Prerequisites: Matriculation into the Advanced Certificate in Advanced Prosthodontics program or the MS in Oral Sciences program and consent of the department head.

**595. Seminar in Prosthodontics and Biomaterials. 0 to 1 Hour.** May be repeated for a maximum of 2 hours of credit. S/U grade only. Students presenting seminars register for 1 hour of credit; others for 0 hour of credit. Current developments in theory and application of prosthodontics and biomaterials with presentations by students, faculty, and visiting scientists. Prerequisites: Matriculation into the Advanced Certificate in Advanced Prosthodontics program or the MS in Oral Sciences program and consent of the department head.

## Psychiatric Nursing (NuPs)

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**400. Group Dynamics, Behavior, and Intervention. 2 to 3 Hours.** Master of Science degree-seeking students in the Mental Health Nursing Concentration must register for 3 hours of credit. Concepts, theories and research pertaining to group dynamics and to interventions carried out in groups. Analysis of videotaped group experience.

**450. Women and Mental Health Nursing. 3 Hours.** Same as GWS 450 and NuSc 450 and NuWH 450. Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. Prerequisite: Consent of the instructor.

**500. Psychopathology for Mental Health Nursing. 3 Hours.**

Theories, research and issues related to psychopathology with emphasis on the nursing process. Interactional research paradigm as it relates to nursing.

**502. Child and Adolescent Development: Applications to Nursing. 3 Hours.** Theory and research on the development of competence through early adolescence. Analysis of intervention programs directed toward improving individual and family adaptive capabilities. Prerequisite: Consent of the instructor.

**503. Theoretical Basis for Intervention in Groups and Families. 3 Hours.** Examines concepts, theories, and research for nursing assessment/intervention with groups/milieu/ families. Emphasis is on nursing roles/responsibilities. Prerequisite: NuPs 400.

**504. Advanced Psychiatric Nursing Care of Children & Adolescents. 3 Hours.** Theory and research related to nursing assessment and treatment of mentally disturbed children and adolescents. Emphasizes multiple determinants of and points of intervention in selected disorders. Prerequisite: NuPs 502.

**505. Advanced Psychiatric Nursing Care of Adults. 3 Hours.** Theory and research on intervention models for psychiatric nursing care of the adult. Analysis of selected therapeutic approaches and techniques. Prerequisite: Consent of the instructor.

**515. Developmental, Behavioral Health, and Interventions with Youth. 3 Hours.** Normative and atypical developmental processes. Applications emphasize developmentally and culturally sensitive nursing assessment and intervention in children's lives to improve mental health outcomes. Prerequisite: NuSc 527 or consent of the instructor.

**516. Behavioral Health Care I. 3 Hours.** Common mental health problems presented in primary and community care settings. Focus on psychopathology, assessment and brief counseling interventions; crisis intervention and triage; emergency care. Prerequisite: Consent of the instructor.

**517. Behavioral Health Care II. 3 Hours.** Complex mental health problems experienced in psychiatric populations. Focus on stabilization and management of psychotic illnesses, dual diagnosis treatment models, psychoeducational models and psychiatric rehabilitation. Prerequisite: NuPs 516.

**518. Family Behavioral Health. 2 Hours.** Theories of family development and behavior; functional and dysfunctional communication and behavioral patterns. Theories and strategies for family assessment and intervention. Prerequisite: Consent of the instructor.

**521. Clinical Practicum in Behavioral Health I. 3 Hours.** Advanced nursing management of common mental health problems. Emphasis on primary care and community settings. Assessment, triage, case management, emergency care and brief interventions. Prerequisite: Credit or concurrent registration in NuPs 517 or consent of the instructor.

**522. Clinical Practicum in Behavioral Health II. 3 to 6 Hours.** May be repeated for credit. Advanced psychiatric nursing with a selected caseload of clients with serious and complex problems. Emphasis on psychiatric rehabilitation, cognitive-behavioral methods, psychoeducation and dual diagnosis. Prerequisites: NuPs 521 and consent of the instructor.

**547. Substance Misuse and Dependence. 3 Hours.** Theories, research trends, treatment perspectives, ethical and social issues related to alcohol and other drug misuse and dependence. Prerequisite: Consent of the instructor.

## Psychology (Psch)

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**411. Stereotyping, Prejudice, and Racism. 3 Hours.** Psychological research and theory concerning stereotyping, prejudice, and racism. Historical conceptualization, development, causes, expression, and psychological consequences of prejudice, as well as theories of prejudice reduction. Prerequisite: Graduate standing in psychology or consent of the instructor.

**415. Health Psychology. 3 Hours.** Psychological theory and research concerning the coronary-prone personality, pain management, controlling adherence to medical regimens, biofeedback, smoking, and weight control.

**417. Psychology and Law. 3 Hours.** Application of psychological theories to the development, operation, and effects of law; evaluation of different and similar approaches of law and psychology. Prerequisite: Psch 312 or consent of the instructor.

**420. Social Development of Urban Children. 4 Hours.**

Same as EPsy 420. General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles. Prerequisite: Admission to the graduate program in education or psychology, or consent of the instructor.

**421. Developmental Psychobiology. 3 Hours.** Concepts and theory integrating behavioral and biological developmental processes, with examples from current research issues. Prerequisite: Consent of the instructor.

**422. Advanced Developmental Psychology and Educational Processes. 3 Hours.** Same as Ed 422. Focuses on cognitive and social development from birth to adolescence. Examines relations between development, learning, and educational processes. Prerequisites: Psch 100 and any one from Ed 210, Psch 259, or 320, or graduate standing and consent of the instructor.

**423. Characteristics of Early Adolescence. 3 Hours.** Same as EPsy 446. Physiological, social, emotional and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. Prerequisites: Admission to the PhD program in psychology; or approval of the College of Education or consent of the instructor, and Ed 210 or 421 or Psch 422.

**429. Constructivist Approaches to Development: Piaget and Vygotsky. 4 Hours.** Same as EPsy 429. Piaget's and Vygotsky's theories of development of knowledge. Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language. Prerequisite: Graduate standing in education and Psch 422 or the equivalent or graduate standing in psychology or consent of the instructor.

**440. Psychological Test Theory. 3 Hours.** Classical and modern theory of tests as developed for assessment of ability, aptitude, and personality. Emphasis on the statistical and mathematical basis of the theories. Prerequisites: Graduate standing, or Psch 343 and consent of the instructor.

**443. Advanced Statistics. 3 Hours.** Design and analysis of experiments: between, within factorial and mixed factorial designs and introduction to multiple regression. For students planning research careers or advanced degrees. Prerequisite: Psch 343.

**450. Advanced Perception. 3 Hours.** Methods, results, and interpretation of experimental studies dealing primarily with the role of contextual and experiential factors in perception. Prerequisites: Psch 350 and consent of the instructor.

**452. Human Learning and Memory. 3 Hours.** Survey of empirical research and theories concerning the human memory system and the encoding, retention, and retrieval of information in that system. Prerequisites: Psch 352 and consent of the instructor.

**454. Psychology of Language. 3 Hours.** Same as Ling 474 and Comm 454. Introductory survey of methods, theory and research; linguistic foundations, history, and present status of the field.

**455. Psychology of Thinking. 3 Hours.** Research and theory concerning higher mental processes, including problem solving, reasoning, judgment, and decision making. Prerequisites: Psch 352 and consent of the instructor.

**456. Human Factors. 3 Hours.** Application of principles of cognitive psychology to the design of equipment and systems for efficient and safe operations and function. Sensory, perceptual, cognitive, and motor skills are emphasized. Prerequisites: Either Psch 350 or 352, and consent of the instructor.

**459. Cognitive Methods. 3 Hours.** Hands-on training in the methods of cognitive psychology, especially computational modeling and the analysis of verbal protocols and other types of trace data.

**460. Advanced Learning. 3 Hours.** Methods, results, and interpretation of experimental studies of basic learning processes in animal and human subjects. Prerequisites: Psch 360 and 361 and consent of the instructor.

**462. Advanced Physiological Psychology. 4 Hours.** Anatomical and physiological substrates of behavior. Prerequisites: Psch 262 and consent of the instructor.

**463. Human Psychophysiology. 3 Hours.** Theory and research on relationships between human bodily processes and psychological processes, including electrocortical, cardiovascular, electromyographic, and electrodermal studies of perception, cognition, arousal, emotion, and development. Prerequisite: Psch 242.

**465. Sensory Processes. 3 Hours.** Psychophysical and physiological studies of sensory systems and processes. Primary emphasis on the early processing of visual stimuli. Prerequisites: Psch 351 and consent of the instructor.

**466. Motivation. 3 Hours.** Review of empirical data and theories concerning the physiological basis of motivational processes in animals and humans. Prerequisites: Psch 360 and consent of the instructor.

**467. Fundamentals of Neuroscience. 3 Hours.** Basic principles of neurophysiology and neuropharmacology including logic bases of nerve action, chemistry of synapses, and actions of pharmacological agents.

**481. Interviewing. 1 Hour.** S/U grade only. Lecture on the theory and practice of clinical interviewing with supervised experience. Prerequisite: Graduate standing in psychology or consent of the instructor.

**494. Special Topics in Psychology. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced treatment of an announced topic.

**495. Seminar in Psychology. 1 to 3 Hours.** May be repeated for a maximum of 9 hours of credit. Students may register for more than one section per term. S/U grade only. Seminar devoted to special topics in psychology.

**505. Advanced History of Psychology. 3 Hours.** The history of scientific psychology, with an emphasis on the forerunners of major contemporary research problems. Prerequisite: Completion of Master's thesis.

**508. Colloquium on the Teaching of Psychology. 1 Hour.** S/U grade only. Required training to prepare graduate students for contact teaching in the Department of Psychology. Prerequisite: Consent of the instructor.

**509. Teaching Psychology: Theory and Research. 2 Hours.** Review of research on human learning and instructional techniques; models of measurement and assessment techniques. Application to teaching undergraduate psychology courses. Prerequisites: Psch 508 and consent of the instructor.

**512. Attitudes and Social Cognition. 3 Hours.** Survey of theory and research in social psychology, including attitudes and social cognition. Prerequisite: Consent of the instructor.

**513. Interpersonal Relations and Group Processes. 3 Hours.** Survey of theory and research in social psychology, including interpersonal relations and group processes. Prerequisite: Consent of the instructor.

**514. Contemporary Trends in Social Psychology. 3 Hours.** Critical analysis of contemporary trends in social psychology, such as emotion in social behavior, applications to the legal system. Content varies. Prerequisite: Consent of the instructor.

**515. Theoretical Perspectives on Women and Gender. 3 Hours.** Same as WS 515. Critical examination of psychological theories and research on women and gender, including biological, psychoanalytic, socialization, power, and social constructionist perspectives. Prerequisite: Graduate standing in Psychology or Psch 315 and consent of the instructor.

**516. Research Methods in Social Psychology. 3 Hours.** Critical analysis of current theories in social psychology. Prerequisites: Psch 512, 513, and 514, or consent of the instructor.

**517. Social Psychology of Education. 4 Hours.** Same as EPsy 502. Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. Prerequisite: Admission to the PhD in Education program or the PhD in Psychology program, or consent of the instructor.

**518. Seminar in Social and Personality Psychology. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Critical discussion of selected topics, such as helping and altruism, social judgment, group processes, attitude formation and change. Content varies. Prerequisite: Consent of the instructor.

**519. Current Topics in Social Psychology. 1 Hour.** May be repeated for credit. S/U grade only. Discussion of recently published research and ongoing research by department faculty and graduate students. Prerequisite: Consent of the instructor.

**520. Development in Infancy and Early Childhood. 4 Hours.** Same as EPsy 526. Consideration of development in the

preschool years. Stress on theory, research, individual child study, and educational implication. Prerequisite: Psch 422 or the equivalent.

**522. Cognitive Development. 3 Hours.** A review of contemporary research on cognitive processes from birth to young adulthood. Prerequisite: Consent of the instructor.

**523. Developmental Psycholinguistics. 3 Hours.** Same as Ling 572 and Comm 524. Theories, research methods and research findings in the area of language development. Biological, cognitive, and social influence; disorders of language development. Prerequisite: Consent of the instructor.

**524. Social Development. 3 Hours.** Review of contemporary research in social development and its context from infancy to young adulthood. Prerequisite: Consent of the instructor.

**525. Achievement Motivation. 4 Hours.** Same as EPsy 530. The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. Prerequisite: Graduate standing in education or psychology or consent of the instructor.

**526. Developmental Psychopathology. 3 Hours.** Major sources and manifestations of maladjustment in childhood with an emphasis on emotional and intellectual handicaps. Prerequisite: Consent of the instructor.

**527. Seminar in Moral Development, Character Formation, and Education. 4 Hours.** Same as EPsy 527. Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. Prerequisite: Psch 422 or the equivalent, or admission to the PhD program in Education, PhD program in Psychology, or PhD program in Social Work, or consent of the instructor.

**528. Seminar in Developmental Psychology. 1 to 4 Hours.** Presentation of selected theoretical and empirical topics in developmental psychology. Prerequisite: Consent of the instructor.

**529. Current Topics in Developmental Psychology. 1 Hour.** May be repeated for credit. S/U grade only. Presentation of current research projects by faculty and students. Prerequisite: Consent of the instructor.

**530. History and the Varied Epistemologies of Community Psychology. 3 Hours.** Analysis of historical factors, including persons, contexts and policies, affecting the development of community research approaches. Implicit causal and value assumptions appraised of varied approaches. Prerequisite: Consent of the instructor.

**531. Community Research. 3 Hours.** Philosophical bases, values, and processes of community research; comparative evaluation of research methods; assessment of mental health issues in community settings, and community prevention programs. Prerequisites: Psch 530 and consent of the instructor.

**532. Community Intervention. 3 Hours.** Same as DHD 532. Theory, research, practice and evaluation of community interventions; types and effectiveness of community intervention; role of the community intervener. Prerequisite: Consent of the instructor.

**533. Advanced Community and Prevention Research. 3 Hours.** Overview of community psychology theory and intervention research in areas like prevention, empowerment, diversity, ecology, competence enhancement, and social change from historical and contemporary perspectives. Prerequisite: Graduate standing in psychology or consent of the instructor.

**537. Seminar in Action Research. 3 Hours.** May be repeated for credit. S/U grade only. Supervised action research in community settings including entry, data collection, ethics, feedback and report preparation. Prerequisite: Graduate standing in the Community and Prevention Research Specialization of the PhD in Psychology or consent of the instructor.

**538. Seminar in Community and Prevention Research. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Examination of a selected topic in community and prevention research. Prerequisite: Psch 530 or consent of the instructor.

**539. Current Topics in Community and Prevention Research. 1 Hour.** May be repeated for credit. S/U grade only. Ongoing seminar with faculty and graduate students to discuss contemporary issues in community and prevention research. Prerequisite: Consent of the instructor.

**541. Introduction to Computing in Psychology. 1 Hour.** S/U grade only. An introduction to applications of computing in psychological research. Several projects are required. Prerequisite: Consent of the instructor.

**542. Research Methods in Psychology. 3 Hours.** Evaluating research results; theory-method relations; ethics; experimental, correlational, and quasi-experimental methods; data collection and analysis in natural settings; unobtrusive measures; causal inference. Prerequisite: Consent of the instructor.

**543. Research Design and Analysis. 4 Hours.** Experimental design, advanced analysis of variance (ANOVA) and statistical analyses for experimental and quasi-experimental designs, interpretation and writing results in APA style, SPSS. Prerequisite: Graduate standing in psychology or consent of the instructor.

**544. Latent Variable Models. 3 Hours.** Statistical methods and practical issues relevant to latent variable models with special emphasis on factor analysis and structural equation modeling. Prerequisite: Psch 545.

**545. Multivariate Analysis. 3 Hours.** The statistical analysis of functional relationships among two or more variables; multivariate regression, canonical correlation, discriminant analysis, multivariate analysis of variance, principal components, factor analysis, logistic regression, cluster analysis. Prerequisites: Psch 543 and graduate standing in psychology; or consent of the instructor.

**546. Theory and Practice in Program Evaluation. 3 Hours.** Introduction to theory, design and practice of program evaluation. Emphasis will be on theories of social programming, selecting appropriate methods, and politics of evaluation. Prerequisites: Psch 531 or the equivalent, 543, and 545; or consent of the instructor.

**547. Psychological Scaling. 3 Hours.** Scaling theory and methodology with emphasis on measurement in psychophysics and social psychology. Prerequisite: Consent of the instructor.

**548. Seminar in Methods and Measurement. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Seminar on a preannounced topic in methodology, measurement or mathematical psychology. Prerequisite: Consent of the instructor.

**549. Current Topics in Psychology and Law. 1 Hour.** May be repeated for credit. S/U grade only. Discussion of recently published research and ongoing research in psychology and law by department faculty, graduate students and outside speakers. Prerequisite: Consent of the instructor.

**550. Proseminar in Educational Psychology. 2 Hours.** Same as EPsy 500. S/U grade only. Interdisciplinary colloquia on selected topics in educational psychology. Serves as introduction to faculty research foci. Prerequisite: Admission to the PhD in Education or the PhD in Psychology program, or consent of the instructor.

**551. Cognition and Instruction. 4 Hours.** Same as EPsy 501. Current research on relations among cognitive processes, learning, and instruction. Prerequisite: Admission to the PhD in Education or the PhD in Psychology program, or consent of the instructor.

**552. Cognition and Instruction: Advanced Constructivist Approaches. 4 Hours.** Same as EPsy 529. Piaget's and Vygotsky's theories of knowledge development. Emphasis on competing approaches concerning the relation of thought to action, to language, and to social relations. Prerequisites: Psch 429 or the equivalent, and admission to the PhD program in the College of Education or Psychology or consent of the instructor.

**558. Seminar in Cognitive Psychology. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Detailed critical review of selected topics in cognitive psychology: emphasis on current research and theoretical developments. Prerequisite: Consent of the instructor.

**559. Current Topics in Cognitive Psychology. 1 Hour.** May be repeated for credit. S/U grade only. Discussion of current research and theoretical issues in broad areas of cognitive psychology. Prerequisite: Consent of the instructor.

**564. Clinical Psychopharmacology. 3 Hours.** Behavioral, cognitive, and biological effects of psychotropic drugs in psychiatric populations. Theoretical, methodological and empirical issues related to the pharmacological treatment of psychopathology. Prerequisite: Consent of the instructor.

**568. Seminar in Biopsychology. 1 to 4 Hours.** May be repeated for credit. Current research issues and studies in biopsychology



are discussed in terms of methodology and theory. Topic to be announced each semester. Prerequisite: Consent of the instructor.

**569. Current Topics in Biopsychology. 1 Hour.** May be repeated for credit. S/U grade only. Presentation of current research projects by staff and students. Prerequisite: Consent of the instructor.

**570. Personality Psychology. 3 Hours.** Contemporary research in personality psychology and a review of theoretical approaches to the study of personality structure and processes. Prerequisite: Consent of the instructor.

**571. Psychopathology. 3 Hours.** Detailed consideration of disorders of behavior including description, etiology, prognosis and experimental and clinical research; also consideration of development and functions of classification systems of abnormal behavior and their relation to clinical decision making. Prerequisites: Psch 570 and consent of the instructor.

**572. Clinical Assessment and Decision Making. 3 Hours.** Psychometric principles, research and theory with special emphasis on clinical inference and decision making with structured personality test. Prerequisites: Psch 571 and consent of the instructor.

**573. Cognitive and Behavioral Assessment. 3 Hours.** Theory and research-based coverage of intellectual, neuropsychological, and behavioral assessment. Focus is on methods and interpretation of psychological testing including both objective and projective methods. Prerequisites: Psch 572 and consent of the instructor.

**574. Techniques of Psychological Intervention. 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Intervention skills, modalities, concepts and techniques for different patient populations and presenting problems. Topics will vary each semester and include: cognitive-behavior therapy, psychodynamic therapy, group therapy and family therapy. Prerequisites: Psch 571 and consent of the instructor.

**575. Psychotherapy Theory and Research. 3 Hours.** Research methods and theory related to psychotherapy and behavior change, with an emphasis on design, evaluation, and results of empirically-based psychotherapy studies. Prerequisite: Psch 571 and consent of the instructor.

**576. Stress, Coping, Support, and Health. 2 Hours.** Individual, environmental, organizational and group processes that facilitate or impede the expression of psychological health. Prerequisites: Psch 571 and consent of the instructor.

**577. Ethics and Professional Development. 1 Hour.** Ethical dimensions of psychology including clinical practice, research and teaching; ethical codes, confidentiality, client rights, dual relationships, legal issues, competency, social responsibility, moral reasoning, values. Prerequisite: Graduate standing in psychology or consent of the instructor.

**578. Seminar in Clinical Psychology. 1 to 4 Hours.** In-depth coverage of selected current topics in clinical psychology. Emphasis is on current research. Prerequisite: Consent of the instructor.

**579. Current Topics in Clinical Psychology. 1 Hour.** May be repeated for credit. S/U grade only. Research and case presentations in clinical psychology. Prerequisite: Consent of the instructor.

**581. Practicum in Interviewing. 1 Hour.** S/U grade only. Interviewing practicum through the Office of Applied Psychological Services. Students observe and conduct clinical interviews under supervision. Prerequisites: Psch 481 and consent of the instructor.

**582. Practicum in Psychological Assessment. 4 Hours.** May be repeated for credit. S/U grade only. Students may register for more than one section per term. Supervised practice in psychodiagnostic testing in various facilities associated with the graduate training program in clinical psychology. Prerequisites: Psch 573 and consent of the instructor.

**583. Practicum in Clinical Intervention. 4 Hours.** May be repeated for credit. S/U grade only. Students may register for more than one section per term. Instruction and supervision in the practice of psychological intervention, application of basic psychological principles to varied parent populations. Prerequisites: Psch 574 and consent of the instructor.

**584. Practicum for Clinical Trainees on Assessment, Intervention, and Research. 0 to 3 Hours.** May be repeated for credit. S/U grade only. Presentation and discussion of trainee assessment, intervention, and research projects. Prerequisite: Acceptance into either a NIMH- or OAPS-sponsored training program.

**587. Practicum in Instruction in Psychology. 2 to 9 Hours.** May be repeated for a maximum of 12 hours of credit. S/U grade only. Students may register for more than one section per term. Seminar on course planning and supervised teaching of an undergraduate course. Prerequisite: Consent of the instructor.

**591. Research Apprenticeship. 2 to 3 Hours.** May be repeated for a maximum of 5 hours of credit. S/U grade only. Directed training in conducting research in specific areas of psychology, and in developing skills related to the research. Prerequisite: Consent of the instructor.

**594. Advanced Special Topics in Psychology. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced treatment of an announced topic. Prerequisite: Consent of the instructor.

**595. Advanced Seminar in Psychology. 1 to 3 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced seminar devoted to special topics in psychology. Prerequisite: Consent of the instructor.

**596. Independent Study. 1 to 12 Hours.** May be repeated for credit. S/U grade only. Research on or study of topics not included in regular classes or thesis and dissertation research. Prerequisite: Consent of the instructor.

**598. Thesis Research. 0 to 16 Hours.** May be repeated for a maximum of 12 hours of credit. S/U grade only. Research on the topic of the master's thesis. Prerequisite: Consent of the instructor.

**599. Dissertation Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Research on the topic of the doctoral dissertation. Prerequisite: Consent of the instructor.

## Public Administration (PA)

**400. Public Administration Theory. 4 Hours.** Development of public administration as a professional and scholarly area of knowledge and practice focusing on administrative reform and its intellectual roots. Politics versus administration, efficiency, effectiveness, representative bureaucracy, and market versus bureaucratic alternatives. Prerequisite: Admission to the MPA program or consent of the instructor.

**405. Introduction to Research Methods and Data Analysis. 4 Hours.** Research methods relevant to the practice and study of public administration such as causation, measurement, and survey research. Data collection, organization, manipulation, and graphing. Univariate statistics: measures of central tendency, dispersion, and standardization. Prerequisite: Admission to the MPA program or consent of the instructor.

**406. Intermediate Data Analysis and Decision Methods. 4 Hours.** Builds on topics in Public Administration 405. Bivariate statistics, significance testing, contingency table analysis, bivariate and multivariate regression, analysis of variance, and time series. Some quantitative decision analysis: decision trees and queueing. Prerequisites: PA 405 and admission to the MPA program or consent of the instructor.

**410. Economics for Public Administration and Policy Decisions. 4 Hours.** Builds on topics in Public Administration 405. Bivariate statistics, significance testing, contingency table analysis, bivariate and multivariate regression, analysis of variance, and time series. Some quantitative decision analysis: decision trees and queueing. Prerequisites: PA 405 and admission to the MPA program or consent of the instructor.

**415. Organization Theory and Public Management. 4 Hours.** Theories and concepts of organizational behavior and public management from economics, sociology and political science. Organizational decision making, bureaucracy, organizational change and learning, public versus private organizations, leadership, and organizational culture. Prerequisite: Admission to the MPA Program or consent of the instructor.

**436. Financial Management of Government. 4 Hours.** Overview of issues and concepts important for administration and management of government's financial affairs: government accounting, purchasing, cash management and investment, risk management, pension and benefits administration, debt management and capital financing. Prerequisite: Admission to the MPA program or consent of the instructor.

**440. Governmental Accounting. 4 Hours.** Introduction to major concepts, principles, and objectives of governmental accounting (including fund accounting) and budgetary control systems for local and

state government. Designed for students with little or no background in accounting. Prerequisite: Admission to the MPA Program or consent of the instructor.

**445. Intergovernmental Management. 4 Hours.**

Relationships between federal, state and local governments focusing on management of overlapping programmatic, regulatory and fiscal responsibilities. Constitutional, political, fiscal, and administrative features and how they have evolved since the 1960s. Prerequisite: Admission to the MPA Program or consent of the instructor.

**450. Innovative Management Practices for Public Administration. 4 Hours.**

Current, innovative managerial practices to improve the performance/efficiency of government and the quality of management. Performance monitoring, strategic planning, process and productivity analysis, reengineering, and possible use of spreadsheets and other software. Prerequisite: Admission to the MPA Program or consent of the instructor.

**455. Management of Information Technology in Government. 4 Hours.**

Concepts and methods of planning, implementing, and managing new information technology or modifying existing technology. Factors contributing to difficulties of implementing information technology decisions and strategies for increasing the likelihood of changing current technology. Prerequisite: Admission to the MPA Program or consent of the instructor.

**460. Computers in Public Administration. 4 Hours.**

Database theory and constructing and managing databases relevant to the operation of government. Utilizes database software and allows students to gain practice with complex database programs and development of a database system. Prerequisite: Admission to the MPA Program or consent of the instructor.

**465. Evaluating Public Programs. 4 Hours.** Different qualitative and quantitative methods used to evaluate the performance and effectiveness of public (and nonprofit) programs and policies. Course requires some familiarity with research methods and statistical techniques. Prerequisites: PA 406 and admission to the MPA Program or consent of the instructor.

**470. Ethics and Accountability. 4 Hours.** Better government through institutionalizing ethics and accountability. Effectiveness of boards of ethics, Inspector General, codes of ethics, and educational programs. History of ethics within the Western intellectual tradition and relevant empirical research on ethical behavior. Prerequisite: Admission to the MPA Program or consent of the instructor.

**475. Labor Management Relations in Public Sector. 4 Hours.** Skills and knowledge to manage labor relations in government. Constitutional influences on public employment, rights of public employees, management and labor unions; civil service laws and regulations, collective bargaining practices, and non-discrimination, and equal opportunity. Prerequisite: Admission to the MPA Program or consent of the instructor.

**480. Online Public Administration. 4 Hours.** Application of the Internet for public management. Web-based service delivery, online governance, the technological divide, and the changing role of public managers. Prerequisite: Consent of the instructor.

**490. Field Experience in Public Administration. 6 Hours.** Students work in an organization such as a government agency, community group, or nonprofit organization. Students are required to submit written work and guide group discussions relevant to their experience and agency. Prerequisite: Admission to the MPA program or consent of the instructor.

**494. Special Topics in Public Administration. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Consideration of timely or enduring issues in public administration not available in regularly offered courses. Prerequisite: Admission to the MPA program or consent of the instructor.

**501. Democratic Theory and Public Administration. 4 Hours.** The conflicts and compatibilities between the requirements of democratic institutions and values and those of public administration. How democratic preferences are affected by the rise of the administrative state. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**502. The Legal Context of Public Administration. 4 Hours.** Legal basis and statutory framework for administrative agencies and actions in government. Relationship between courts and public agencies, rulemaking and adjudicative powers of public agencies, and impact of specific laws on government. Prerequisite: Admission to

the MPA program or consent of the instructor.

**503. Public Personnel Management. 4 Hours.** History and current innovations in managing personnel and other areas of human resources. Compensation, classification, affirmative action, performance appraisal, labor relations, and unions. Statutory and court decisions affecting government personnel issues. Prerequisite: Admission to the MPA Program or consent of the instructor.

**504. Budgeting for Public Administration. 4 Hours.**

Processes and methods relevant to government finances and fiscal health: revenues, taxation, budget formulation, operating budgets, cost analysis, planning and performance, budget reforms, politics, capital budgeting, and role of budgeting in management. Prerequisites: PA 410 and admission to the MPA program or consent of the instructor.

**505. The History and Development of Public Administration Research and Theory. 4 Hours.**

The history and development of modern public administration, with emphasis on the U.S. model. Major scholarly movements; institutional developments; other factors shaping the present state of the discipline. Prerequisite: Admission to the PhD Program in Public Administration or approval of the instructor.

**510. Organization Theory and Behavior in Public Administration Research. 4 Hours.**

Analysis of major analytical models of organizations; decision-making; control and accountability; change and development; inter-organizational relations; the organization-environment interface. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**515. The Bureaucracy and Policy process. 4 Hours.**

Theories and research issues concerning the role of administrators in policy formation. Case studies and research on federal, state, and local agencies. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**520. Comparative and Developmental Public Administration. 4 Hours.**

Analysis of theoretical, methodological, and practical issues in comparing public administration cross-culturally. Theoretical models and empirical studies of bureaucracies and administrative problems. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**525. Human Resource Development and Management in Public Administration. 4 Hours.**

A review of the literature of public personnel administration including recruitment, examination, selection, evaluation, promotion, and career development. Motivation theory, equal rights, and affirmative action issues. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**531. Intergovernmental Administration. 4 Hours.**

Examines division of functions among levels of government, areas of overlapping program responsibility, intergovernmental finance flows, administrative and regulatory relationships. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**535. Organizational Planning and Design. 4 Hours.**

Relation between organizational structure and performance. Diagnosis and treatment of organizational pathologies. Design of organizational advisory and planning processes. Comparative merits of select organizational structures. Prerequisite: Admission to the PhD program in Public Administration or approval of the program director.

**540. Research Design for Public Administration. 4 Hours.**

Logic and methods of quantitative and nonquantitative research in public administration. Issues in measurement; causal inference; experimental and quasi-experimental designs; and methods of data collection. Prerequisite: Admission to the PhD program in Public Administration or approval of the program director.

**541. Advanced Data Analysis I. 4 Hours.** Elements of matrix theory; introduction to the theory of estimation; hypothesis testing; logit and probit models; factor analysis; and principal components analysis. Application of techniques to public administration research. Prerequisite: PA 540.

**542. Advanced Data Analysis II. 4 Hours.**

For those likely to pursue careers in the more quantitative aspects of public administration research. Discrete multivariate analysis and regression; multivariate analysis of variance; other advanced techniques. Prerequisite: PA 541.

**543. Financial Management in Public Administration. 4 Hours.**

Principles of financial management and applications in various institutional and programmatic settings. Forecasting techniques,

computer applications, innovations in public borrowing and debt management. Prerequisite: Admission to the PhD program in Public Administration or approval of the instructor.

**593. Independent Research in Public Administration. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisites: Approval of the director of graduate studies and consent of the instructor.

**594. Special Topics in Public Administration. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study of an announced topic. Prerequisite: Admission to the PhD in Public Administration program or consent of the instructor.

**596. Independent Study in Public Administration. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of a topic under guidance of select faculty. Prerequisites: Approval of the director of graduate studies and consent of the instructor.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual study and research. Prerequisite: Open only to degree candidates, upon approval of topic and by dissertation committee.

## Public Health Nursing (NuPH)

**400. Introduction to Occupational Health Nursing. 2 Hours.** Theoretical bases for application of public health nursing practice to working population in occupational settings. Prerequisite: Consent of the instructor.

**402. School Nursing Theory and Trends. 2 Hours.** Theoretical frameworks, health needs, and legal mandates for school-aged populations are explored. School nursing practice models are studied as relevant to managing school health programs. Prerequisite: Consent of the instructor.

**420. School Nursing Practicum. 3 Hours.** Concepts and principles of school nursing applied within the school community. Clinical experience with an emphasis on development of a school health program. Prerequisites: Concurrent registration in NuPH 402 and consent of the instructor.

**455. Women's Health: A Primary Health Care Approach. 3 Hours.** Same as CHSc 456 and NuSc 455 and NuWH 455. Health promotion and disease prevention in women's health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

**465. International Nursing. 2 Hours.** Forum for exchange of ideas, experiences, and readings on effect of political structures, socio-cultural and economic forces on health care systems and nursing education. Prerequisite: Consent of the instructor.

**500. Health Maintenance & Promotion in Primary Care Nursing. 2 Hours.** Prepares nurse practitioners to provide health maintenance and promotion to families and individuals in primary care settings. Prerequisite: Credit or concurrent registration in NuSc 532 or consent of the instructor.

**515. Advanced Nursing Management in Community-Focused Health Services. 3 Hours.** Same as NuAS 515. Theory and research in leadership, management, and community-focused assessment for advanced nursing practice in complex and integrated health systems. Prerequisite: NuSC 528 or consent of the instructor.

**516. Evaluation of Health Services Outcomes for Nursing. 3 Hours.** Same as NuAS 516. Program planning and evaluation in community-focused health services. Measurement of quality, performance, and impact on health programs and services. Interdisciplinary perspective. Integrated quality improvement systems. Prerequisite: NuAS 515 or consent of the instructor.

**517. Budget and Finance of Health and Nursing Services. 3 Hours.** Same as NuAS 517. Financial management techniques, supply and demand, cost behaviors, and revenue sources, provider reimbursement and public and private health insurance for health and nursing services will be analyzed. Prerequisite: NuPH 515 or consent of the instructor.

**518. Field Study in Health and Nursing Management. 3 Hours.** Same as NuAS 518. Field study emphasizing leadership within population-focused nursing management practice including organization

and management concepts from public and private perspective. Prerequisite: NuPH 516 and 517 or consent of the instructor.

**524. Primary Care Nursing of Acute and Chronic Disorders I. 4 Hours.** Prepares nurse practitioners to assess, diagnose and manage stable chronic and acute episodic illnesses encountered in primary care settings. Prerequisite: NuPH 500.

**525. Primary Care Nursing of Acute and Chronic Disorders II. 6 Hours.** Second of a two-course sequence designed to prepare nurse practitioners to assess, diagnose and manage stable chronic and acute episodic illnesses encountered in primary care settings. Prerequisite: NuPH 524.

**526. Organizational Analysis of Home Care Systems. 3 Hours.** Utilizes organizational framework to analyze the home care industry. Structure, function, history, trends, reimbursement and legislation are examined with respect to public health nursing. Prerequisite: Consent of the instructor.

**528. Advanced Clinical Practice in Primary Care Nursing. 1 to 5 Hours.** S/U grade only. Health care issues, advanced clinical skills and supervised practicum experiences specific to student's selected practice area or population groups in rural, urban or international settings. Prerequisite: NuPH 524.

**529. Practicum in Occupational Health Nursing. 1 to 5 Hours.** Practicum emphasizing interdisciplinary experience in the identification of work-related health problems, their treatment, and follow-up. Learning activities are individualized to meet the student's learning needs. Prerequisites: NuPH 400 and credit or concurrent registration in EOHS 421 and 482 and 551.

**560. Models/Frameworks of Health Service Delivery/Health Behavior. 2 Hours.** Critiques health services delivery and health promotion/disease prevention behavior models; examines cultural, community and organizational models and contextually, socially, and psychologically based health behavior models. Prerequisite: NuSc 505 or consent of the instructor.

**561. Research in Health Services Delivery and Health Behavior. 2 to 4 Hours.** Analyzes culturally, community, and organizationally based research on health delivery models; analyzes research reflecting cognitive and affective influences on health promotion/disease prevention behavior. Prerequisite: Consent of the instructor.

**562. Measurement Issues/Health Service Delivery/Promotion Behavior. 2 Hours.** Extends beyond overview courses. Critically examines those measurement concepts, techniques, and issues important to advanced research in health services delivery and health promotion behavior. Prerequisites: NuSc 515 or equivalent and consent of the instructor.

**565. Advanced Research in Women's Health. 1 to 2 Hours.** Same as NuSc 565 and NuWH 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique on-going and developing research. Prerequisite: Consent of the instructor.

**570. International Dimensions in Women's Health. 3 Hours.** Same as NuSc 570 and NuWH 570. Critical examination of the health of women from a global perspective. Emphasizes resources and strategies nurse researchers use to monitor women's health across cultures and countries. Prerequisite: Consent of the instructor.

## Public Policy Analysis (PPA)

**401. Data Analysis I. 4 Hours.** Same as PolS 401. Statistical inference for the social sciences. Emphasis on univariate and bivariate statistics.

**500. Introduction to Policy and Governance. 4 Hours.** Same as PolS 500. Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored.

**501. Data Analysis II. 4 Hours.** Same as PolS 501. Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. Prerequisite: PPA 401.

**540. Economics for the Social Sciences. 4 Hours.** Same as Econ 540. Credit is not given for Econ/PPA 540 if the student has credit in Econ 501 or 520. Introduction to economics for graduate students in the social sciences. Economic cost, incentives, resource allocation and economic institutions. Supply and demand analysis.



Economic behavior of consumers and households, business firms, government and not-for-profit institutions.

**541. Policy Formulation, Implementation, Evaluation. 4 Hours.** Same as PolS 541. Introduction to political science theories of how elections, interest groups and state structure affect the formulation of public solutions to societal problems.

**544. Research Design for Policy Analysis. 4 Hours.** Same as Ed 544. Alternative research design models and program evaluation methodologies; quantitative and qualitative approaches; ethnography and historiography; experimentation and quasiexperimentation; causal modeling. Prerequisites: Admission to the PhD program in Public Policy Analysis and one graduate-level course in statistics.

**574. The Impact of College on Students. 4 Hours.** Same as PS 574. Introduction to the research evidence on the impact of college on students. Emphasis is placed on methods of assessing impact and research on college effects. Prerequisite: Consent of the instructor.

**575. Higher Education Organization and Administration. 4 Hours.** Same as PS 575. Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. Prerequisite: Admission to the PhD program in Public Policy Analysis or consent of the instructor.

**576. History of Higher Education. 4 Hours.** Same as PS 576. Key historical events that have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. Prerequisite: Admission to the PhD program in Public Policy Analysis or consent of the instructor.

**577. American Academic Profession. 4 Hours.** Same as PS 577. Historical and systemic foundations of the academic profession. Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. Prerequisites: Admission to the PhD program in Public Policy Analysis and consent of the instructor.

**584. Methods of Urban Policy Analysis. 4 Hours.** Same as UPP 584. Analytic, allocative and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. Prerequisite: Consent of the instructor.

**590. Advanced Public Policy Workshop. 4 Hours.** Same as PolS 590. Interdisciplinary workshop on preparing a dissertation proposal for PPA students. Prerequisites: Advanced standing in the PPA program and completion of PPA core courses.

## Religious Studies (RelS)

**415. Milton. 4 Hours.** Same as Engl 415. Survey of Milton's poetry and prose, with emphasis on *Paradise Lost*. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**446. Race, Ethnicity, and Gender in American Religion. 4 Hours.** Same as Soc 446. Religious institutions in the U.S. as a crucible for racial, ethnic, and gender identities, group formation, and intergroup relations; major world religions represented in the U.S. Prerequisite: Soc 100 or consent of instructor.

**478. The Bible as Literature. 4 Hours.** Same as Engl 478, JSt 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**479. Religion and Literature. 4 Hours.** Same as Engl 479. Literary works considered in the light of several religious traditions. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

**495. Topics in Religious History. 4 Hours.** Same as Hist 495. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

## Russian (Russ)

**400. Russian for Scholarly Translation. 4 Hours.** Does not satisfy the foreign language requirement. An elective for students in fields other than Russian language and literature. Learning to translate specialized texts in the humanities, social, and natural sciences.

**401. Russian Composition and Conversation III. 4 Hours.** Oral presentations, compositions, conversation: daily life and

current events. Problems of grammar and syntax. Improving pronunciation and intonation. Reading. Prerequisite: Russ 302 or the equivalent.

**402. Russian Composition and Conversation IV. 4 Hours.** Continuation of Russ 401. Prerequisite: Russ 401 or the equivalent.

**410. Structure of Modern Russian. 4 Hours.** A synchronic linguistic analysis of Russian substantives, adjectives, pronouns, verbs, deverbal nouns, and minor parts of speech from a syntagmatic and paradigmatic point of view. Prerequisite: At least 4 semester hours of Russian or the equivalent.

**450. Studies in the Russian Novel. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a major novelist, movement, or special themes. Content varies. Prerequisite: 24 hours of Russian or consent of the instructor.

**460. Studies in Russian Literature. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a major author, movement, genre, or special topic. Content varies. Prerequisite: 24 hours of Russian or consent of the instructor.

**499. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

**510. History of the Russian Language. 4 Hours.** Formation and development of standard Russian to the end of the eighteenth century. Analysis of selected texts. Prerequisite: Russ 410 or Slav 505 or the equivalent.

**515. Topics in Contemporary Russian Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Russ 410 or the equivalent.

**520. Topics in Historical Russian Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Specific topics are announced each term.

**550. Studies in Russian Romanticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

**555. Studies in Russian Realism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

**560. Studies in Russian Neo-Realism and Modernism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

**565. Studies in Soviet Prose. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a topic or movement. Content varies.

**570. Studies in Russian Literary Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a critical school or movement. Content varies.

**575. Methods and Principles of Translation. 4 Hours.** Introduction to theory and methods of Russian-English and English-Russian literary translation. Intensive practice in kinds of translation: expository prose, literary prose, and poetry.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

## Slavic (Slav)

**405. Problems in Slavic Grammars. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Systematic review of important topics in grammar and syntax. Content varies. Required for department undergraduate majors in Slavic programs. Prerequisite: Russ 302 or Pol 302 or Slav 302, or the equivalent.

**410. Structure of Modern Serbian. 4 Hours.** A synchronic linguistic analysis of Serbian phonology and morphology, with fundamentals of syntax. Prerequisite: Slav 104 or the equivalent, or consent of the instructor.

**433. Topics in Eastern European History. 4 Hours.** Same as Hist 433. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

**460. Studies in East European Literatures and Culture. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Study of a topic, author, genre, or movement. Prerequisite: 24 hours of Slavic or Baltic or consent of the instructor.

**470. Educational Practice with Seminar I. 6 Hours.**

Graduate credit only with the approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**471. Educational Practice with Seminar II. 6 Hours.**

Graduate credit only with the approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Slav 470, and approval of the department.

**499. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

**505. Old Church Slavonic. 4 Hours.** Phonology, morphology, and basic elements of syntax. Readings in selected texts. Prerequisite: Three years of a Slavic language or consent of the instructor.

**510. History of Serbian Language. 4 Hours.** A diachronic linguistic analysis of Serbian phonology and morphology with fundamentals of syntax. Prerequisite: Slav 104 or the equivalent or consent of the instructor.

**515. Topics in Contemporary Serbian Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Slav 410.

**520. Topics in Historical Serbian Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Slav 505 or consent of the instructor.

**525. Topics in Serbian Syntax. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Content varies.

**530. Topics in Ukrainian Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Variable content.

**535. Topics in Comparative Slavic Linguistics. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Comparative study of various linguistic aspects of the Slavic languages.

**536. Topics in Comparative Slavic Literatures. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Comparative study of a literary topic or movement. Content varies.

**542. Studies in Serbian Poetry. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Specific topics are announced each semester.

**545. Studies in Serbian Prose I. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Specific topics of the Serbian short story and novel are announced each term.

**546. Topics in Serbian Prose II. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Specific topics of Serbian drama are announced each semester.

**548. Studies in Yugoslav Literatures. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Specific topics are announced each term.

**550. Studies in Yugoslav Literary Historiography and Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Major concepts and movements in South Slavic literary history.

**560. Studies in Ukrainian Renaissance and Baroque Literature. 4 Hours.** Ukrainian prose, poetry and drama of the sixteenth, seventeenth, and eighteenth centuries.

**562. Studies in Ukrainian Romantic and Post-Romantic Poetry. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a period or movement in nineteenth- and early twentieth-century Ukrainian poetry. Content varies.

**563. Studies in Twentieth-Century Ukrainian Poetry. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a period or movement. Content varies.

**565. Studies in Nineteenth-Century Ukrainian Prose. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Study of genre, topic, period, movement or author. Content varies.

**566. Studies in Twentieth-Century Ukrainian Prose. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Study of a genre, topic, period, movement or author. Content varies.

**568. Studies in Ukrainian Drama. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Study of a period, movement or author. Content varies.

**570. Studies in Ukrainian Literary Historiography and Criticism. 4 Hours.**

May be repeated for a maximum of 12 hours of credit. Study of methodology, periods, schools and groups, individual literary historians and critics. Content varies.

**575. Studies in Slavic Literary Theory. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Russian, Czech, Polish and Serbian contributions to literary theory: formalism, structuralism, semiotics, phenomenology. Taught in English.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a faculty member. Prerequisites: Consent of the instructor and the head of the department.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Open only to PhD degree candidates. Students engaged in research and writing theses will be assigned to this course at the discretion of the department. Independent research on a topic approved for a graduate thesis. Prerequisite: Consent of the department.

## Social Work (SocW)

**401. Human Behavior and the Social Environment. 3 Hours.**

No credit given if the student has credit in SocW 535. Human development through the life cycle including urban family, group, community, and organizational interactions with social, cultural, psychological factors. Prerequisite: Consent of the instructor, or admission to the MSW program.

**411. Social Work in a Multicultural Society. 3 Hours.**

No credit given if the student has credit in SocW 537. Place of social work in a multicultural society; focus on racial and ethnic minority groups, particularly African Americans, Latinos, Asian Americans, and Native Americans. Prerequisite: Admission to the MSW program.

**420. Policy I: Social Welfare Policy and Services. 3 Hours.**

No credit given if the student has credit in SocW 550. Social work history; structure and development policies; policy analysis and policy advocacy skills for social and economic justice. Prerequisite: Admission to the MSW program.

**430. Practice I: Generalist Practice with Individuals, Families, and Groups. 3 Hours.**

No credit given if student has credit in SocW 501. Generalist practice principles applied to individuals, families, and groups including content on community context, racial and ethnic minorities, poor, oppressed, and other urban vulnerable communities. Prerequisite: Admission to the MSW program.

**431. Practice II: Generalist Practice with Task Groups, Organizations, and Communities. 3 Hours.**

No credit given if student has credit in SocW 502. Generalist practice principles applied to task groups, organizations, and communities including focus on community context and the poor, oppressed and other urban vulnerable communities. Prerequisite: SocW 430.

**460. Research I: Social Work Research. 3 Hours.**

No credit given if student has credit in SocW 560. Research methodology basics applied to social work: problem formulation, design, measurement, sampling, data analysis, computerization, ethics, qualitative and quantitative methodologies. Prerequisite: Admission to the MSW program.

**480. Special Studies in School Social Work Practice. 3 Hours.**

Ecological and strengths-based interventions in urban school systems. Prerequisite: Admission to the post-MSW Type 73 program.

**501. Practice I. 2 Hours.** Overview of generalist social work practice identifying concepts, values, and skills designed to assist individuals, groups, families, organizations, and communities to achieve personal and social change.

**502. Practice II. 2 Hours.** Continues SocW 501. Theory and application of study, assessment, intervention and evaluation processes

as applied to practice with individuals, families and groups. Prerequisite: SocW 501.

**503. Family Practice in Urban Communities. 3 Hours.** Empowering at-risk urban families using strengths-based intervention; brief treatment models; attention to diversity, community, poor, and other urban at-risk populations. Prerequisite: SocW 430.

**504. Group Theory and Practice. 3 Hours.** Theory and practice of social work with empower groups in both clinical and large system settings; diversity and equity issues. Prerequisite: SocW 430.

**505. Community Theory and Practice. 2 Hours.** Theories of community, community power systems, political/economy, social change, advocacy, and community organization. Skills in analysis. Organizing people for effective planning and community problem solving. Prerequisite: SocW 502.

**506. Community Organizing for Action and Social Change. 2 Hours.** Advanced knowledge and skills in community organizing for direct action to achieve social change for and with disadvantaged urban populations. Prerequisite: SocW 505 or consent of the instructor.

**507. Agency-Based Community Practice. 2 Hours.** Advanced knowledge and skills in agency-sponsored community practice with disadvantaged urban populations. Prerequisite: SocW 505 or consent of the instructor.

**510. Practice in Concentrations. 2 to 4 Hours.** May be repeated for credit. Theory and skill development in the use of practice methods in selected fields such as child and family, health, management and policy, mental health, occupational social work, and school social work. Topics vary according to areas of concentration. Prerequisites: SocW 502 and 536, or consent of the instructor.

**511. Practice with Children. 3 Hours.** Direct treatment with urban at-risk children including situations involving homelessness, substance abuse, violence; treatment modalities emphasizing family, community, culture. Prerequisite: SocW 430.

**513. Brief Individual Treatment in Managed Care. 3 Hours.** Brief treatment interventions (cognitive behavioral, psycho dynamics, and solution focused) with adult clients in urban managed care settings; focus on strengths-based interventions and diversity. Prerequisite: SocW 430.

**514. Advanced Family Practice. 2 Hours.** An ecological/integrative systems perspective is used in developing skills at an advanced level in clinical assessment of and intervention with families. Prerequisites: SocW 503 and 535.

**515. Practice with Families in Transition. 2 Hours.** Critical issues in families on the continuum from divorcing to single parent to reconstituted systems. Dynamics of these systems as well as specific appropriate interventions. Prerequisites: SocW 503 and 535.

**516. Practice with Couples. 3 Hours.** Practice with urban couples with attention to diversity, poverty and other urban at-risk factors and problems including substance abuse, violence, mental disorders, and sexual problems. Prerequisite: SocW 430.

**517. Practice with Family Violence, Neglect, and Abuse. 3 Hours.** Ecological approach to family violence: physical, psychological and sexual abuse of children, women and elders at practice and policy levels; urban vulnerable population. Prerequisite: SocW 430 or consent of the instructor.

**518. Practice with Economically Disadvantaged Families. 2 Hours.** Approaches to practice with economically disadvantaged families including advocacy, crisis intervention, and brief family therapy interventions. Emphasis on ethnic or racial minority status clients and single parent families. Prerequisites: SocW 502 and 535.

**521. Aging Populations: Social Work Response. 3 Hours.** Psychological, social, biological aging factors of individuals and families; emphasis on practice skills for community, long-term care and hospital-based services with urban emphases. Prerequisite: SocW 410 or consent of the instructor.

**522. Crisis Intervention. 3 Hours.** Nature of crises including suicide and large-scale disaster; strengths-based interventions in urban settings; medical and mental health facilities, schools, community centers, and neighborhoods. Prerequisites: SocW 430.

**523. Drug and Alcohol Abuse and Social Work. 3 Hours.** History and pharmacology of alcohol and other drugs; etiology of abuse and dependence; assessment and treatment models; practice in

multi-disciplinary settings; emphasis on urban systems. Prerequisites: SocW 430.

**524. Practice with Addictive and Compulsive Behavior. 2 Hours.** Understanding and treatment of addictions to substances, gambling, sexual activity, and disordered eating. Psychotherapeutic, behavioral, and self-help approaches to individual, family, and group treatment. Prerequisites: SocW 502 and 535.

**525. Social Work with Women. 3 Hours.** Same as GWS 525. Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. Prerequisites: SocW 410; or consent of the instructor.

**526. Supervision and Consultation in Social Work Practice. 2 Hours.** Adult learning processes, agency functioning, and the process and dynamics of supervision and consultation in agency and community. Basic techniques involved in different models of supervision and consultation practice. Prerequisites: SocW 502 and 535.

**527. Topics in Social Services. 3 Hours.** Critical review of selected areas of social work, social services, and social welfare. Prerequisites: Consent of the instructor, and admission to the MSW program.

**528. Information Management in Social Welfare. 2 Hours.** Use of information technology to support management decision-making, planning, and evaluation. Information as an organizational asset and professional resource. Systems and decision-making concepts for study of the development, implementation, management and improvement of information systems and services. Prerequisites: SocW 502 and 561, or consent of the instructor.

**530. Leadership in Human Service Organizations. 3 Hours.** Executive leadership of urban social service agencies; study of leadership theories and strategies. Prerequisite: SocW 410.

**532. Social Work in Corrections. 3 Hours.** Policy and practice roles of social workers in correctional settings with emphasis on race, ethnicity, gender, sexual orientation and poverty factors. Prerequisite: SocW 410 or consent of the instructor.

**533. Sexual Minority Communities. 3 Hours.** Community and social justice framework applied to gay, lesbian, bisexual and transgendered populations; historical development of sexual minority communities; overview of social work response. Prerequisite: Admission to the MSW program or consent of the instructor.

**534. Independent Study in Practice. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Independent study in practice area not covered by existing course offerings. Prerequisite: Consent of the instructor.

**535. Human Behavior and the Social Environment. 3 Hours.** Human development from prenatal through late adulthood: physiological, social, and cultural influences on development.

**536. Human Service Organizations in the Community. 2 Hours.** The human service organization and the community as social systems; theories and models of HSOs and communities. Prerequisite: SocW 535.

**537. Intergroup Relations in a Multicultural Society. 2 Hours.** Economic, political, and social forces influencing economic and social status of minorities examined from an ecological perspective, as are minority impacts on total society. Prerequisite: Consent of the instructor.

**538. Human Sexuality: Social Work Applications. 2 Hours.** Sexual development and understanding of normal and abnormal sexual behavior with focus on increasing professional skills and sensitivity to clients with sexual concerns. Prerequisite: SocW 535 or consent of the instructor.

**539. Mental Health Issues with Children and Adolescents. 3 Hours.** Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with children and adolescents. Prerequisite: SocW 410; or consent of the instructor.

**540. Mental Health Issues with Adults. 3 Hours.** Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with adults. Prerequisite: SocW 410; or consent of the instructor.

**541. Psychopathology in Mental Health. 2 Hours.** Psychopathology through the life cycle including clinical diagnosis, understanding of severe to mild mental disorders in adults, adolescents, and children and family interaction. Implications for social work



practice in mental health settings. Prerequisite: SocW 535 or consent of the instructor.

**542. Human Behavior and Health Care. 2 Hours.**

Interrelatedness of physical, social, and psychological factors of illness and implications for social functioning of patients and families; knowledge base required for hospital social workers, etc. Prerequisite: SocW 535 or consent of the instructor.

**543. Organizational Theory in Social Welfare. 2 Hours.**

Examination of organization theory and analysis. Understanding organizational structures and processes within human service organizations. Critiques of models for organizational designs and research on human service organizations. Prerequisite: SocW 535 or consent of the instructor.

**544. Community Violence. 3 Hours.** Urban community violence; impact on individuals and society; policies and theories critically studied from race, class, and gender perspectives; social work implications. Prerequisite: SocW 410 or consent of the instructor.

**545. HIV/AIDS: Social Work Challenges. 3 Hours.** HIV prevention and intervention in urban setting; system and ecological understanding of impact of HIV on society and role of social work practice and policy. Prerequisite: SocW 410 or consent of the instructor.

**549. Independent Study in Human Behavior and the Social Environment. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Independent study in HBSE areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

**550. Social Welfare Policy and Services. 2 Hours.**

History, economic and social base, as well as the nature and scope of the United States social welfare system and its response to the needs and problems of its citizens. Current provisions and alternatives in social security and other social welfare programs and services.

**551. Policy II: School Social Work Policy. 3 Hours.**

Critical analysis of federal, state, and local policies relevant to social work practice in urban school systems. Prerequisite: SocW 420.

**552. Policy II: Child and Family Policy. 3 Hours.** Critical analysis of policies affecting welfare of families and children; focus on child welfare, juvenile justice, adult criminal justice, mental health, and special education systems. Prerequisite: SocW 420.

**553. Policy II: Health Care Systems and Policies. 3 Hours.** Critical analysis of current health care programs and policies including policy change skills; content on urban poor and at-risk populations. Prerequisite: SocW 420.

**554. Policy II: Mental Health Policy. 3 Hours.** Critical analysis of policies and structures in mental health delivery system with focus on urban and chronically mentally ill populations. Prerequisite: SocW 420.

**555. Occupational Social Policy and Services. 2 Hours.** Introduction to occupational social work and the provision of services in work settings. Theoretical framework for delivery of social services in work settings, values, issues, and corporate policy development relevant to occupational social work. Prerequisite: SocW 550 or consent of the instructor.

**556. Policy II: Community and Administrative Practice. 3 Hours.** Critical analysis of national, state, and local policies affecting urban community building and development. Prerequisite: SocW 420.

**558. Social Work and the Law. 3 Hours.** Social work input in legal system: family law, family violence, crime, delinquency, civil rights, education, health, mental health, social advocacy, social work practice regulation. Prerequisite: SocW 420 or consent of the instructor.

**559. Independent Study in Social Welfare Policy and Services. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Independent study in SWPS areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

**560. Social Work Research. 2 Hours.** Application of basic concepts of research methodology to social work including problem formulation, design, measurement, sampling, and data analysis. Basic principles and concepts for evaluation of social work practice through single system and group designs. Critique of selected studies. Prerequisite: 3 hours of social statistics or the equivalent.

**561. Computer Applications in Social Work. 3 Hours.** Uses of computers in knowledge and information creation,

dissemination, and utilization by social workers. Emphasizes evaluation of practice and service delivery. Introduces computer concepts and operations. Direct experience with University academic computer system. Considers implications of computers for social work values, practice, and clients. Microcomputers and mainframe software package experience. Prerequisite: SocW 560.

**562. Information and Decision Support Systems for the Social Services. 3 Hours.** Functions of information and decision support systems; accountability; assessment of service delivery; planning, management, and direct practice decision-making. Analysis of data and information requirements and capabilities. Methodologies for development or redesign of decision support and information systems. Conceptual, measurement, ethical, and staff engagement factors specific to social services. Prerequisite: SocW 560.

**563. Program Evaluation. 3 Hours.** Review and assessment of evaluative approaches in social work practice and policy. Prepares students for evaluation of own practice. Prerequisite: SocW 560.

**565. Research Seminars: Social Service Issues. 3 Hours.** Methodologies and results of research in selected fields of social services; special issues and problems in practice; relationship of research, theory, and practice; priorities for future research. Prerequisite: SocW 560 or consent of the instructor.

**567. Research Project. 0 to 8 Hours.** S/U grade only. May be repeated for credit. Application of research methods to social work problems in an individual or group project or library research project. Preparation of a formal report based on field study processes and findings. Prerequisites: SocW 560 or consent of the instructor, and approval of the college.

**569. Independent Study in Research. 1 to 3 Hours.** May be repeated for a maximum of 6 hours of credit. Independent study in research methodology or areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

**570. Field Instruction I. 5 Hours.** S/U grade only. Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisite: Consent of the instructor.

**571. Field Instruction II. 5 Hours.** S/U grade only. Students are assigned to social agencies where, under the supervision of an agency field instructor, they carry selected cases or groups for social work services. Prerequisites: SocW 570 and consent of the instructor.

**572. Field Instruction III. 8 Hours.** S/U grade only. Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisites: SocW 571 and consent of the instructor.

**573. Field Instruction IV. 8 Hours.** S/U grade only. Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisites: SocW 572 and consent of the instructor.

**574. Special Studies in Field Instruction I. 2 to 4 Hours.** S/U grade only. Practicum experiences in approved social agencies/organizations where students carry selected cases, applying knowledge to skill applications under the supervision of an agency field instructor. Prerequisite: Consent of the instructor.

**575. Special Studies in Field Instruction II. 2 to 4 Hours.** S/U grade only. Practicum experiences in approved social agencies/organizations where students carry selected cases, applying knowledge to skill applications under the supervision of an agency field instructor. Prerequisite: Consent of the instructor.

**577. Social Welfare History. 3 Hours.** Social work history in context of political, economic, and social developments; focus on gender, class, and race; critical application of theoretical models. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

**579. Integrative Seminar. 2 Hours.** May be repeated for a maximum of 4 hours of credit. Application of concepts of social work practice, policy, and research to selected fields of social service. Focus on appropriate service delivery models and intervention strategies. Prerequisites: Concurrent registration in SocW 575 and consent of the instructor.

**580. Practice III: Community and Administrative Practice. 3 Hours.** Management of human service organizations;

resource acquisition and management; planning; community relations; focus on urban, community-based agencies. Prerequisite: SocW 431.

**581. Practice IV: Community and Administrative Practice. 3 Hours.** Advanced urban community building and developing; emphasis on poor, at-risk communities. Prerequisite: SocW 580.

**582. Practice III: Practice with Children and Families. 3 Hours.** Ecological and strengths-based practice with urban children and families; special focus on child welfare. Prerequisite: SocW 431.

**583. Practice IV: Practice with Children and Families. 3 Hours.** Advanced critical analysis and application of ecological and strengths-based practice emphasizing interactions of children and families with urban courts, schools, and child welfare systems. Prerequisite: SocW 582.

**584. Practice III: Health Care. 3 Hours.** Theoretical basis and skills for health social work in diverse settings; bio-psychological understanding of health and disease; emphasis on direct practice with urban clients and families. Prerequisite: SocW 431.

**585. Practice IV: Health Care. 3 Hours.** Advanced knowledge and skills in health care settings; specific populations including urban poor and at-risk populations; emphasis on urban community and organizational levels. Prerequisite: SocW 584.

**586. Practice III: Mental Health. 3 Hours.** Strengths-based assessment and treatment planning in urban settings; diversity issues; managed care settings; critical use of current mental health diagnostic and classification systems. Prerequisite: SocW 431.

**587. Practice IV: Mental Health. 3 Hours.** Advanced urban mental health practice; diversity issues; focus on children and adolescents and their families; critical application of current mental health diagnosis and classification. Prerequisite: SocW 586.

**588. Practice III: School Social Work. 3 Hours.** Ecological and strengths-based perspectives on development of basic competencies for urban school social work; diversity issues. Prerequisite: SocW 431.

**589. Practice IV: School Social Work. 3 Hours.** Advanced interventions in urban school systems; use of groups, consultation, classroom interventions, family empowerment, conflict resolution and community interventions; diversity issues. Prerequisite: SocW 588.

**590. Analysis of Social Work Practice Approaches. 3 Hours.** Historical and current developments in the conceptualization of social work practice. Implications of practice approaches for contributing to social justice. Values and ethics addressed. Extensive computer use required. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

**591. Social Welfare Policy Analysis and Development. 3 Hours.** Analysis of social welfare policies with particular attention to issues of social and economic justice; conceptual models for analysis; application of models to selected problems. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

**592. Models of Social Work Scholarship and Knowledge Development. 3 Hours.** Functions of scholarship in social work, contributions of scholarship to social and economic justice, research methodologies and knowledge building processes for practice and policy analysis. Extensive computer use required. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

**593. Quantitative Methods in Social Work Research. 3 Hours.** Selected statistical and analytical methods as applied to social issues. Use of computerized tools, sampling, hypothesis testing, descriptive and inferential procedure, introduction to multivariate analysis. Extensive computer use required. Prerequisite: Admission to PhD in Social Work program or consent of the instructor.

**594. Dissertation Proseminar in Social Work. 3 Hours.** Preparation in development of dissertation focus and planning of dissertation research. Readings are assigned and discussed in class. Emphasis on ideas for dissertation topic, its formulation, operationalization, and research design. Prerequisites: SocW 592 and 593.

**595. Seminar in Social Work Education. 3 Hours.** Preparation for roles as social work educators. Historical development of social work education with special emphasis on relation between curriculum design and the accreditation process. Pedagogical issues such as selecting educational objectives, teaching methods, and evaluation of student performance. Student must participate in a teaching laboratory. Prerequisite: Admission to the PhD in Social Work program.

**596. Proseminar on Selected Topics and Issues in Social Work. 2 to 4 Hours.** May be repeated for credit. Review and critique of selected areas of social work content, theory, or practice. State of current knowledge and needed research stressed. Prerequisite: Admission to the PhD in Social Work program.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual research, under faculty direction, on social work doctoral dissertation. Prerequisite: Consent of the instructor.

## Sociology (Soc)

**400. Sociological Analysis. 4 Hours.** Procedures for analyzing original or secondary research data; writing literature reviews, proposals, data summaries, and research reports; computer-assisted data analysis and text preparation. Prerequisites: Soc 201 and 202 or 6 hours of upper-division courses in the social sciences including at least one course in introductory statistics and research methods, or consent of the instructor.

**401. Sociological Statistics. 4 Hours.** Descriptive and inferential statistics for graduate and advanced undergraduate sociology majors and related fields. Tests of means, regression, correlation, analysis of variance, and related topics. Prerequisites: Soc 201 and 202 or consent of the instructor.

**402. Intermediate Sociological Statistics. 4 Hours.** The general linear model emphasizing regression. Analysis of variance and covariance. Simple structural equation models. Simple categorical methods. Elementary matrix algebra. Prerequisite: Soc 401.

**405. Writing in the Social Sciences. 4 Hours.** Leads to effective, clear writing for a social science audience. Teaches how to organize ideas, avoid tiresome jargon and write with precision. Prerequisite: 6 hours of upper-division social science courses.

**408. Fieldwork: Ethnographic and Qualitative Fieldwork Techniques. 4 Hours.** Same as Anth 418. Practical introduction to the techniques of anthropologists and qualitative sociologists for research in natural social settings: participant observation/nonparticipant observation, interviewing, use of documentary sources. Prerequisite: Anth 213 or Soc 202 or consent of the instructor.

**409. Topics in Sociological Research. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisites: Soc 201 and 202, or consent of the instructor.

**410. Advanced Survey of Social Psychology. 4 Hours.** Survey of the major theories, methods, and research in sociological social psychology. Prerequisite: Soc 110 or consent of the instructor.

**419. Topics in Social Psychology. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of a specialized topic announced when the course is scheduled. Prerequisite: Soc 110 or 410, or graduate standing in sociology, or consent of the instructor.

**423. Age Groups and the Social Order. 4 Hours.** Age groups in primitive, industrial, and postindustrial societies; concepts of the life cycle; life-course transitions; cohorts; aging populations; intergenerational relations; politics of aging. Prerequisite: 6 hours of upper-division sociology.

**424. Sociology of Gender. 4 Hours.** Same as WS 425. Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family; economy. Prerequisite: 6 hours of upper-division sociology or gender and women's studies courses or consent of the instructor.

**425. Race and Ethnic Relations. 4 Hours.** Critical examination of the conceptual frameworks and empirical findings in the study of race and ethnic relations. Prerequisite: 6 hours of upper-division sociology including Soc 225, or consent of the instructor.

**426. Topics in Race and Ethnic Relations. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology including Soc 225, or consent of the instructor.

**430. Topics in Deviance and Social Control. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Intensive examination of a specialized topic announced when the class is

scheduled. Prerequisite: 6 hours of upper-division sociology including Soc 230, or consent of the instructor.

**433. Sociology of Law. 4 Hours.** The origin and development of law in various social settings; relationship to other social norms with special attention to the difference between legal and nonlegal forms of social control. Prerequisite: 6 hours of upper-division sociology including Soc 230, or consent of the instructor.

**440. Topics in Organizations and Institutions. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**441. Social Stratification. 4 Hours.** The nature of systems of differentiation and ranking in societies and their consequences; emphasis on class structure in the United States; prestige, status, power, and social mobility in the United States and other societies. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**444. Industrial Sociology. 4 Hours.** Same as Mgmt 444. Analysis of industrial society and industrial institutions, the meaning of work and work relations, technology and economic change. Prerequisite: 6 hours of upper-division sociology or management, or consent of the instructor.

**445. Sociology of the Family. 4 Hours.** Variety and change in family patterns, family formation and break-up, parents' and children's effects on each other, influences of culture and political economy, consequences for other institutions. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**446. Race, Ethnicity, and Gender in American Religion. 4 Hours.** Same as RelS 446. Religious institutions in the U.S. as a crucible for racial, ethnic, and gender identities, group formation, and intergroup relations; major world religions represented in the U.S. Prerequisite: Soc 100 or consent of instructor.

**447. Organizations. 4 Hours.** Same as Mgmt 447. Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisite: 6 hours of upper-division sociology, management, or political science, or consent of the instructor.

**448. Sociology of Development. 4 Hours.** Historical, economic, political, social, and geographic factors shaping national and international development experiences and outcomes. Prerequisite: 6 hours of upper-division social science courses or consent of the instructor.

**451. Medical Sociology. 4 Hours.** Survey of major topics in sociology of health and medicine including social definitions of health and illness, patient-practitioner interaction, the organization of health institutions and professions. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**452. Social Epidemiology. 4 Hours.** Social and cultural factors in health and disease; individual and social reactions to health and disease. Methods of social epidemiology applied to chronic and acute disease. Prerequisites: Soc 201 and 451, or consent of the instructor.

**453. Health Care Systems. 4 Hours.** Organization of medical and health care in the United States and other selected countries, methods of delivering care to various populations with emphasis on urban medicine. Prerequisite: Soc 451 or consent of the instructor.

**455. Topics in Medical Sociology. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: Soc 451 or consent of the instructor.

**465. Topics in Sociology of Politics. 4 Hours.** Same as PolS 465. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**471. Population. 4 Hours.** Same as Epid 471. The measurement and study of major trends and differentials in fertility, mortality, migration, growth, and compositional characteristics of the population of the United States and other nations. Prerequisite: 6 hours of upper-division sociology including Soc 201, or consent of the instructor.

**473. Cities and Regions. 4 Hours.** Characteristics, conditions, and consequences of structure and change of cities and metropolitan

regions. Spatial, political economy, cultural perspectives. Census, ecological, historical, comparative data for cities. Prerequisite: 6 hours of upper-division sociology including Soc 201, or consent of the instructor.

**475. Topics in Population and Human Ecology. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology including Soc 201, or consent of the instructor.

**476. Topics in Urban Sociology. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**477. The Urban Community in Chicago. 4 Hours.** Nature and development of Chicago community areas and suburbs; segregation and change in community areas; basis and structure of metropolitan communities. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**485. Classical Sociological Theory. 4 Hours.** Survey and analysis of classical European and American social theory, such as Marx, Weber, Durkheim, Veblen, and Park. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**487. Contemporary Sociological Theory. 4 Hours.** Review and evaluation of major currents in sociological theory since the 1940's. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

**488. Theories in Social Psychology. 4 Hours.** In-depth treatment of major theoretical traditions in social psychology. Prerequisite: Soc 110 or 410, or consent of the instructor.

**496. Independent Study or Research. 1 to 9 Hours.** May be repeated for credit with the approval of the department. Students may register for more than one section per term. Extensive readings in specialized areas of sociology or empirical research. Prerequisites: 18 hours of sociology (excluding Soc 296 and 299), consent of the instructor, and approval of the department.

**500. Sociological Research Methods I. 4 Hours.** Introduction to research design, data gathering and data reduction; logic of problem formulation, units of analysis, measurement, data analysis.

**501. Sociological Research Methods II. 4 Hours.** Evaluating sociological research, data analysis and reporting; proposal writing and evaluation; professional issues including research ethics; student presentation of master's research proposals. Prerequisite: Soc 500.

**509. Seminar: Sociological Research Methods. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**510. Seminar: Social Psychology. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics. Prerequisites: Soc 410 and 488, or consent of the instructor.

**520. Seminar: Race, Ethnicity, and Gender. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**528. Societal Analysis of Aging, Health, and Health Care. 3 Hours.** Same as CHSc 528. Analysis of aging, health and health care issues mainly from sociological and public health perspectives. Review and application of appropriate concepts, theories and methods. Prerequisite: CHSc 425 or consent of the instructor.

**530. Seminar: Deviance and Social Control. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**540. Seminar: Social Institutions. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**547. Seminar: Social Organization. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.



**548. Seminar: Comparative Societies. 1 to 7 Hours.** May be repeated for credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**550. Proseminar on Current Research in Health, Illness, and Medicine. 4 Hours.** Review and critique of current research in the following health areas: health care systems, social epidemiology, and health and illness behavior. Prerequisite: Soc 451.

**551. Seminar: Sociology of Health and Medicine. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics. Prerequisite: Consent of the instructor.

**565. Seminar: Political Sociology. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**571. Seminar: Population and Human Ecology. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**572. Sociology of Education. 4 Hours.** Same as PS 572. Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education, inequality and educational reform. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

**585. Seminar: Sociological Theory. 1 to 7 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

**593. Colloquium on College Teaching of Sociology. 0 to 4 Hours.** May be repeated for credit. Sociological analysis of contemporary university teaching; strategies and techniques for presentation of sociology at the college level.

**595. Departmental Seminar. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Presentation and discussion of issues of professional concern to sociologists including current research, consulting, teaching and applied sociology.

**596. Independent Study. 1 to 12 Hours.** May be repeated for credit. Students may register for more than one section per term. Research on special problems not included in the graduate thesis. Prerequisites: Consent of the instructor and approval of the department.

**597. Project Research. 0 to 16 Hours.** S/U grade only. May be repeated for a maximum of 6 hours of credit. Supervised writing and research on topic of the master's paper. Prerequisites: Soc 501 and consent of the instructor.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only.

## Spanish (Span)

**400. History of the Spanish Language. 4 Hours.** Origins and development of Spanish; phonological, morphological, syntactic development of the language; foreign influences; origin of dialects. Prerequisite: Span 205 or 300, or consent of the instructor.

**402. Spanish Syntax. 4 Hours.** Structure of the grammatical system of Spanish. Analysis of the most important syntactic phenomena with emphasis on the meaning and function of grammatical forms. Prerequisite: Span 305 or consent of the instructor.

**403. Advanced Spanish Syntax. 4 Hours.** Structure of the grammatical system of Spanish. In-depth analysis of selected syntactic phenomena. Prerequisite: Span 402 or the equivalent or consent of the instructor.

**404. Spanish Phonology and Morphology. 4 Hours.** Analysis of the phonological and morphological structure of Spanish. Emphasis on the production and mental representation of sounds. Prerequisite: Span 205 or the equivalent.

**405. Advanced Spanish Phonology and Morphology. 4 Hours.** Advanced and detailed study of the phonological and morphological structure of Spanish. Emphasis on current theories. Prerequisite: Span 404 or the equivalent or consent of the instructor.

**406. Spanish Sociolinguistics. 4 Hours.** Past and current theoretical and empirical sociolinguistics as applied to the study of variation within Spanish and U.S. Hispanic communities. Prerequisite: Span 402 or 404 or consent of the instructor.

**408. Hispanic Dialectology. 4 Hours.** Descriptive and historical analysis of the most salient linguistic phenomena of peninsular and American Spanish dialects. Prerequisite: Span 300 or 404 or the equivalent.

**410. Spanish Medieval Literature. 4 Hours.** Literary, social, and cultural developments in Medieval Spain, as reflected in *Cantar de mio Cid*, *Libro de buen amor*, *El conde Lucanor* and *La Celestina*. Prerequisite: Span 310.

**412. Literary Forms in the Early Spanish Golden Age. 4 Hours.** Renaissance and sixteenth-century lyric poetry: examples of picaresque, pastoral, and mystical prose. Prerequisite: Span 310.

**413. Literary Forms in the Later Spanish Golden Age. 4 Hours.** The comedia; culteranismo and conceptismo; the prose of Quevedo and Gracian. Prerequisite: Span 310.

**414. Don Quijote. 4 Hours.** Detailed study of the text; novelistic techniques and influence on the development of the novel. Prerequisite: Span 310.

**420. Modern Spanish Literature I: From Cadalso to Galdos. 4 Hours.** Literary movements in the eighteenth and nineteenth centuries with special emphasis on Romanticism and Realism. Prerequisite: Span 311.

**421. Modern Spanish Literature II: From Unamuno to Garcia Lorca. 4 Hours.** Representative authors and tendencies from the end of the nineteenth century to the outbreak of the Civil War. Prerequisite: Span 311.

**422. Contemporary Spanish Literature: From Cela to the Present. 4 Hours.** The most important authors and tendencies in twentieth-century Spain. Prerequisite: Span 311.

**430. Spanish American Literature of the Colonial Period. 4 Hours.** Conquest to independence. From the narrative of discovery, conquest and indigenous traditions, to Renaissance epic, Baroque poetry, and the literature of the Enlightenment. Prerequisite: Span 312.

**431. Modern Spanish American Literature I. 4 Hours.** Nineteenth-century literary trends from the beginnings of the novel through Romanticism and Realism to Modernismo. Prose and poetry. Prerequisite: Span 312.

**432. Modern Spanish American Literature II. 4 Hours.** Representative authors and movements from post-modernismo through Vanguardism and the tendencies of the last twenty years. Emphasis on poetry. Prerequisite: Span 312.

**433. Modern Spanish American Narrative. 4 Hours.** The development of fiction in Spanish America from the Romantic era to the neo-realist novel and short story of the 1930's. Prerequisite: Span 312.

**434. Contemporary Spanish American Narrative. 4 Hours.** Emergence of the New Fiction. Representative works of the 1940's from South and Central America, Mexico, and the Caribbean, through contemporary developments of the "boom". Prerequisite: Span 312.

**435. Advanced Topics in Hispanic Literature. 4 Hours.** Intensive study of a particular genre, theme, author or period within Spanish, Latin American or Latino literature with emphasis on literary analysis and critical writing. Prerequisites: Span 210, 211 and consent of the instructor.

**436. Special Topics in the Teaching of Spanish. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which course is given. Taught in English. Some semesters may be taught in Spanish. Prerequisite: Approval of the Department.

**450. Foreign Language Teaching Methodology. 4 Hours.** Same as Fr 481 and Ital 460. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisites: Three courses at the 200- and 300-levels.

**451. Educational Practice with Seminar I. 6 Hours.** Graduate credit only with approval of the department. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department.

**452. Educational Practice with Seminar II. 6 Hours.** Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Span 451, and approval of the department.

**453. Spanish Applied Linguistics and Teaching. 4 Hours.** Issues in second language acquisition and foreign language acquisition research. Analysis of traditional and innovative methods in Spanish as a foreign and second language. Prerequisite: Consent of the instructor.

**455. Internship in Teaching Practice. 4 Hours.** Practicum in teaching Spanish as a second language to college adults, in developing communicative competence and in relating language to culture; classroom visitation. Prerequisite: Restricted to departmental teaching assistants in Spanish.

**471. Spanish Culture and Society. 4 Hours.** Same as Anth 471 and LALS 471. Introduction to themes in Spanish culture and society based primarily upon the literature in anthropology. Parallel sets of readings in Spanish and English.

**500. Research in Hispanic Studies. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Basic concepts of linguistic and literary theory; introduction to areas of research in linguistics and literature. Prerequisite: Admission to the graduate program in Hispanic Studies or consent of the instructor.

**502. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours.** Same as Fr 502. No credit given if student has credit in Span 450 or Fr 450 or Ger 407. This course introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice. Taught in English. Prerequisite: Appointment as a teaching assistant. For students outside the department: consent of the instructor.

**505. Seminar in Spanish Descriptive Linguistics. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Topics in phonology, morphology, syntax, semantics or pragmatics of Spanish. Prerequisites: One 400-level Spanish course and one from Spanish 402, 404, or 408, or consent of the instructor.

**507. Seminar in Second Language Acquisition and Bilingualism. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Current theoretical and research directions of bilingualism and second language acquisition by non-natives. May include original empirical research projects.

**510. Seminar in Spanish Medieval Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. An intensive study of relevant genres, periods, figures and movements of Spanish medieval literature.

**512. Seminar in Golden Age Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Particular areas, genres, works or figures in sixteenth- and seventeenth-century Spanish literature.

**520. Seminar in Modern Spanish Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Particular areas, genres, works or figures in modern Spanish literature.

**530. Seminar in Spanish American Literature. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Intensive study of relevant genres, periods, figures and movements in Spanish-American literature.

**535. Concepts and Methodologies in Hispanic Interdisciplinary Studies. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Inception and development of Latin American society from interdisciplinary perspectives. Cultural evolution from the encounter of European values and indigenous cosmogony to New World syncretism.

**540. Seminar on Language in Context. 4 Hours.** Past and current theoretical and empirical directions as applied to the study of oral and written discourse and its social context. Prerequisites: One 400-level Spanish course, and two from Span 402, 404, 406, and 408.

**594. Special Topics in Hispanic Studies. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Topics which involve multiple approaches to problems in linguistics and literature, or which cross the chronological and geographical boundaries established in the seminars.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Provides for areas of study not regularly covered by departmental offerings. Study proposals must conform to departmental guidelines. Prerequisite: Consent of the instructor.

**598. MA Thesis Research. 0 to 16 Hours.** S/U grade only. Students involved in thesis research and writing are assigned to the course at the discretion of the graduate committee. Prerequisite: Consent of the graduate committee.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for a maximum of 24 hours of credit. S/U grade only. The writing of a PhD thesis based on original research in the area of the candidate's major specialization (literature, linguistics, or culture). Prerequisites: Admission to candidacy for the doctoral degree and consent of director of graduate studies.

## Special Education (SpEd)

**410. Survey of Characteristics of Learners with Disabilities. 3 Hours.** Fulfills requirements for Illinois House Bill 150. Field experience required. Learning and personality characteristics of exceptional learners. Diagnostic processes and educational approaches are examined. Prerequisite: Ed 210 or 421, or graduate standing and consent of the instructor.

**423. Assessment of Monolingual and LEP Children with Disabilities. 4 Hours.** Psychoeducational assessment of monolingual and limited English proficient children with learning disabilities. First and second language development. Theoretical and practical aspects of measurement and testing. Prerequisite: SpEd 410 or the equivalent.

**424. Assessment of Students with Special Needs. 4 Hours.** Theoretical basis and practical application of standardized and alternative testing of children with learning and behavior difficulties. Prerequisite: SpEd 410.

**426. Curricular/Behavioral Considerations for Learners with Special Needs. 4 Hours.** Instructional practices related to academics, classroom management, individualized and group instruction for students with special needs. Prerequisite: SpEd 424 or the equivalent or consent of the instructor.

**427. Curricular and Behavioral Considerations for LEP Learners with Special Needs. 4 Hours.** Exploration of best practice instruction and behavior management for limited English proficient students with learning disabilities, behavioral disabilities, and/or mild cognitive delays. Prerequisite: SpEd 410 or the equivalent, or consent of the instructor.

**442. Language Development and Disorders. 4 Hours.** Theory and research on the acquisition of phonology, syntax, semantics, and pragmatics in children with and without disabilities. Models for language assessment and intervention. Prerequisite: SpEd 410.

**448. Topics in Special Education. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Course or workshop on preannounced topic on the education of handicapped children, adolescents, or adults. Prerequisites: SpEd 410 and consent of the instructor.

**461. Political and Socio-Cultural Perspectives on Special Education. 3 Hours.** Same as Ed 461. Students will examine issues of access and equity through legislation, litigation, and socio-cultural perspectives and be introduced to major theoretical frameworks that influence special education programs. Field work required.

**462. Assessment of Individuals with Disabilities. 3 Hours.** To prepare students in the use of formal and informal assessment in making decisions regarding placement, instructional planning, and evaluation of students with disabilities. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**463. Instructional Adaptations in Reading and Writing I. 3 Hours.** Emphasizes the components of designing, implementing, and assessing reading and writing instruction for individuals with disabilities at the elementary level. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**465. Cognitive Development and Disabilities. 3 Hours.** Same as EPsy 465. Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and

intervention. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**466. Language Development, Diversity, and Disabilities. 3 Hours.** Same as EPsy 466. Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**467. Social and Emotional Development and Disabilities. 3 Hours.** Same as EPsy 467. Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5–21 with and without disabilities. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**471. Curricular Adaptations for Learners with Significant Disabilities. 3 Hours.** This course is designed to address methods of instruction, assessment, planning for instruction, development and evaluation of learning environments, and instructional delivery for students with significant disabilities. Field work required. Prerequisites: SpEd 465 and 466 and 467; or consent of the instructor.

**472. Promoting Academic and Prosocial Behavior I. 3 Hours.** Same as Ed 472. Explores the importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**473. Teaching Math and Science with Adaptations. 3 Hours.** Same as Ed 473. Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**481. Theoretical Foundations of Bilingual/ESL Special Education. 4 Hours.** Overview of historical, political, pedagogical, and theoretical issues involved in the education of students with special learning needs and who are second language learners. Prerequisite: SpEd 410 or the equivalent or consent of the instructor.

**482. Forging Collaborations with Family and Community. 3 Hours.** Same as EPsy 482. Develops skills necessary to work in partnership with the families of children with disabilities, and community members. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**500. Research Methods in Special Education. 4 Hours.** Research strategies and statistical methods for the assessment of applied and theoretical research studies in special education. Prerequisite: SpEd 410 or consent of the instructor.

**506. Characteristics of Infants and Young Children with Disabilities. 4 Hours.** Biological and environmental factors in infancy may cause developmental disabilities. Impact of such factors on developing sensory, motor, cognitive, social, and emotional competence reviewed. Prerequisites: Ed 422 and SpEd 500; or consent of the instructor.

**507. Children with Disabilities and the Family. 4 Hours.** Strategies for working with families of young children with disabilities. Focus on parents and siblings within community context. Design and implementation of individual family service plans. Prerequisite: SpEd 506 or 511 or 513 or 515.

**508. Intervention for Infants and Young Children with Disabilities. 4 Hours.** Intervention methods for infants and young children at-risk for or showing developmental delays. Systems perspective on utilizing family and community to support intervention. Field experience. Prerequisite: SpEd 506.

**509. Assessment of Infants with Disabilities and their Families. 4 Hours.** Acquaints students with major norm-referenced developmental tests, screening tests, and systematic observation techniques appropriate for infants/families. Prerequisite: SpEd 506.

**511. Characteristics of Learning Disabilities. 3 Hours.** Characteristics of and educational implications for cognitive, language, academic, and social-emotional development in students with learning disabilities. Field experience. Prerequisite: SpEd 500.

**512. Instructional Methods for Students with Learning Disabilities. 3 Hours.** Development and evaluation of individualized educational programs for learning disabled students, including instructional methods and materials. Field experience. Prerequisite: SpEd 511.

**513. Characteristics of Mental Retardation. 3 Hours.**

The nature, characteristics and educational implications for the cognitive, social, and physical development of persons with mental retardation. Field experience. Prerequisite: SpEd 500.

**514. Instructional Methods for Students with Mild Mental Retardation. 2 Hours.** Instructional theory, methods, and techniques; and behavioral and academic objectives for students with mild mental retardation. Field experience. Prerequisites: SpEd 513 and concurrent registration in SpEd 515.

**515. Instructional Methods for Students with Moderate to Profound MR. 2 Hours.** Instructional theory and techniques, instructional methods and materials, and behavioral and academic objectives for moderate, severe, and profound mental retardation. Field experience. Prerequisites: SpEd 513 and concurrent registration in SpEd 514.

**516. Characteristics of Students with Emotional and Behavioral Disorders. 3 Hours.** Exploration of the risk factors and different theoretical approaches associated with the development and prevention of serious emotional and behavioral disorders. Field experience. Prerequisites: SpEd 424 and 426.

**517. Instructional Methods for Students with Emotional and Behavioral Disorders. 3 Hours.** Instructional programming for the academic and social development of students with serious emotional and behavioral disorders. Strategies for effective classroom and behavioral management. Field experience. Prerequisite: SpEd 516.

**522. Special Educator as Consultant. 4 Hours.** Training for consultants in educational and employment settings: consultation models, observation, and coaching skills to use with educators, parents, employers, and community-agency personnel. Prerequisite: SpEd 410 or equivalent or consent of the instructor.

**537. Special Education Practicum. 6 to 12 Hours.** Practice teaching in the field of special education; focus on teaching students who are experiencing social and/or emotional disturbance, mental retardation, or learning disabilities. Prerequisites: Completion of 100 clock hours of pre-student-teaching field experiences; completion of a sequence in an area of special education; and consent of the advisor. Applications are due two semesters in advance.

**538. Internship in Special Education. 1 to 9 Hours.** Students may register for more than one section per term. Clinical, research or field-based internship experiences for Special Education majors. Prerequisites: SpEd 424 and 426 and 500; and consent of the instructor one semester prior.

**564. Proseminar in Special Education. 4 Hours.** Various areas of special education research are reviewed. Topics include areas of faculty research. Prerequisites: SpEd 500 or consent of the instructor; and admission to PhD program in Special Education.

**572. Promoting Academic and Prosocial Behavior II. 2 Hours.** Provides an in-depth examination of serious problem behavior and the skills to develop individualized programs to address the academic and social needs of challenging students. Field work required. Prerequisite: SpEd 472 or consent of the instructor.

**573. Understanding Research in Special Education. 3 Hours.** Overview of research methodology appropriate for teachers of special populations with emphasis on developing skills in critically reading research reports. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

**576. Internship in Assessment. 3 Hours.** Internship experiences in an assessment clinic for special education majors. Field work required. Prerequisite: SpEd 462 or the equivalent or consent of the instructor.

**577. Field Teaching Internship Experience. 3 Hours.** Field-based internship experiences for special education. Field work required. Prerequisite: Approval of the program faculty.

**578. Classroom-Based Inquiry Internship. 3 Hours.** Field-based internship experiences in special education classrooms. Field work required. Prerequisite: Approval of the program faculty.

**579. Research Internship. 3 Hours.** Students work on a specific research project under the direction of a faculty member. Field work required. Prerequisites: SpEd 573. or the equivalent and consent of the instructor.

**580. Student Teaching in Special Education. 6 Hours.** Practice teaching in the field of special education. Field work required. Prerequisites: SpEd 463 and 471 and 473 and 572 and 573 and 576 and 577; and approval of the program faculty.



**583. Instructional Adaptations in Reading and Writing II. 3 Hours.** Students learn advanced strategies for designing, implementing, and assessing reading and writing instruction for individuals with disabilities at the middle school and secondary level. Field work required. Prerequisites: SpEd 461 and 463; or consent of the instructor.

**592. Seminar on Theory and Research in Special Education. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Systematic in-depth review of theory and research on selected topics in special education. Prerequisites: SpEd 500 and consent of the instructor.

**593. PhD Research Project. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the PhD in Education program.

**595. Seminar in Special Education. 4 Hours.** S/U grade only. Discussion of current literature in the field of special education. Prerequisite: SpEd 564.

**596. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Students independently study related topics not covered by courses, under faculty supervision. Prerequisites: SpEd 500 or the equivalent, and consent of the advisor and the instructor.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student's dissertation. Prerequisite: Consent of the dissertation advisor.

## Statistics (Stat)

**401. Introduction to Probability. 4 Hours.** Probability spaces, random variables and their distributions, conditional distribution and stochastic independence, special distributions, sampling distributions, limit theorems. Prerequisite: Grade of C or better in Math 210.

**411. Statistical Theory. 4 Hours.** Estimation, tests of statistical hypotheses, best tests, sufficient statistics, Rao-Cramer inequality, sequential probability ratio tests, the multivariate normal distribution, nonparametric methods. Prerequisite: Grade of C or better in Stat 401.

**416. Nonparametric Statistical Methods. 4 Hours.** Distribution-free tests for location and dispersion problems, one-way and two-way layouts, the independence problem, regression problems involving slopes, detecting broad alternatives, resampling methods. Prerequisite: Grade of C or better in Stat 381 or 411.

**431. Introduction to Survey Sampling. 4 Hours.** Simple random sampling, sampling proportions, estimation of sample size, stratified random sampling, ratio estimators, regression estimators, systematic and cluster sampling. Prerequisite: Grade of C or better in Stat 411 or 481.

**461. Applied Probability Models I. 4 Hours.** Computing probabilities and expectations by conditioning, Markov chains, Chapman-Kolmogorov equations, branching processes, Poisson processes and exponential distribution, continuous-time Markov chains, reversibility, uniformization. Prerequisite: Grade of C or better in Stat 401.

**462. Applied Probability Models II. 4 Hours.** Renewal theory, regenerative processes, semi-Markov processes, queueing theory, exponential models, M/G/1 and G/M/1 systems, reliability, bounds on the reliability function, system life, Brownian motion, stationary processes. Prerequisite: Grade of C or better in Stat 461.

**471. Linear and Nonlinear Programming. 4 Hours.** Linear programming, simplex algorithm, degeneracy, duality theorem sensitivity analysis, convexity, network simplex methods, assignment problems. Constrained and unconstrained minima. Quasi-Newton methods. Ellipsoidal methods of Kachian. Prerequisite: Grade of C or better in Math 310.

**473. Game Theory. 4 Hours.** Games in extensive and normal form. Minimax theorem. Solving matrix games via linear programming. Nash equilibria for nonzero-sum games, Shapley value, bargaining models. Prerequisite: Grade of C or better in Math 310 or Stat 401.

**477. Introduction to Reliability Theory. 4 Hours.** Structural and probabilistic properties of coherent systems, notions of aging and classes of life distributions, preservation properties, dependent

components, optimal allocation models. Prerequisite: Grade of C or better in Stat 401 or consent of the instructor.

**481. Applied Statistical Methods II. 4 Hours.** Linear regression, introduction to model building, analysis of variance, analysis of enumerative data, nonparametric statistics, product and system reliability, quality control. SAS and SPSSX applications. Prerequisite: Grade of C or better in Stat 381.

**486. Statistical Consulting. 4 Hours.** Introduction to statistical consulting methods and techniques. Handling and transformation of raw data sets in CMS. Statistical analysis of data sets with SAS and SPSSX. Prerequisite: Grade of C or better in Stat 411 or 481.

**494. Special Topics in Statistics, Probability, and Operations Research. 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each semester in which it is given. Topics drawn from areas such as distribution theory, Bayesian inference, discrete optimization, applied probability models, resampling techniques, biostatistics, environmental sampling. Prerequisite: Approval of the department.

**496. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.

**501. Probability Theory I. 4 Hours.** Abstract measure theory, probability measures, Kolmogorov extension theorem, sums of independent random variables, the strong and weak laws of large numbers, the central limit theorem, characteristic functions, law of iterated logarithm, infinitely divisible laws. Prerequisite: Math 534 or consent of the instructor.

**502. Probability Theory II. 4 Hours.** Radon-Nikodym Theorem, conditional expectations, martingales, stationary processes, ergodic theorem, stationary gaussian processes, Markov chains, introduction to stochastic processes, Brownian motions. Prerequisite: Stat 501.

**511. Advanced Statistical Theory I. 4 Hours.** Statistical models, criteria of optimum estimation, large sample theory, optimum tests and confidence intervals, best unbiased tests in exponential families, invariance principle, likelihood ratio tests. Prerequisite: Stat 411.

**512. Advanced Statistical Theory II. 4 Hours.** Basic concepts in decision theory, prior and posterior distributions, Bayesian decision theory, hierarchical models, robustness, minimax analysis, invariance principle, sequential analysis, completeness. Prerequisite: Stat 511.

**521. Linear Statistical Inference. 4 Hours.** Estimation and testing in linear models, generalized inverses of matrices, n-dimensional normal distribution, quadratic forms, likelihood ratio tests, best invariant tests, analysis of variance. Prerequisite: Stat 411.

**522. Multivariate Statistical Analysis. 4 Hours.** Multivariate normal distribution, estimation of mean vector and covariance matrix, T-square statistic, discriminant analysis, general linear hypothesis, principal components, canonical correlations, factor analysis. Prerequisite: Stat 521.

**531. Sampling Theory I. 4 Hours.** Foundations of survey design and inference for finite populations; the Horvitz-Thompson estimator; simple random, cluster, systematic survey designs; auxiliary size measures in design and inference. Prerequisite: Stat 411.

**532. Sampling Theory II. 4 Hours.** Uses of auxiliary size measures in survey sampling; cluster sampling; systematic sampling; stratified sampling; superpopulation methods; randomized response methods; resampling; nonresponse; small area estimations. Prerequisite: Stat 531.

**535. Optimal Design Theory I. 4 Hours.** Gauss-Markov theorem, optimality criteria, optimal designs for: 1-way, 2-way elimination of heterogeneity models, repeated measurements, treatment-control; equivalence theorem, approximate designs for polynomial-regression. Prerequisite: Stat 521.

**536. Optimal Design Theory II. 4 Hours.** Construction of optimal designs: BIB, Latin square and generalized Youden, repeated measurements, treatment-control studies; construction of factorial designs including orthogonal arrays. Prerequisite: Stat 535 or consent of the instructor.

**561. Applied Stochastic Processes I. 4 Hours.** Kolmogorov consistency theorem and classification of stochastic

processes. Markov chains and basic limit theorems for Markov chains. Continuous time Markov chains. Renewal processes. Prerequisites: Stat 461 and Math 533 or consent of the instructor.

**562. Applied Stochastic Processes II. 4 Hours.**

Martingales, Brownian motion, branching processes, stationary processes. Prerequisite: Stat 561.

**571. Noncooperative Games. 4 Hours.** Extensive games. Separation and fixed point theorems. General minimax theorems. Nash equilibria. War duels. Completely mixed games. Games with convex payoff. Stochastic games. Prerequisite: Stat 461 or Math 411.

**572. Cooperative Game Theory. 4 Hours.** Utility theory. Games with side payments, stable sets, core, bargaining sets, Shapley value, Nucleolus. Market games. NTU value. Multilinear extensions, non-atomic games. Prerequisite: Stat 571 or consent of the instructor.

**575. Optimization Methods in Matrices. 4 Hours.** Nonnegative matrices. Completely mixed games. Perron-Frobenius Theorem. Markov chains, input output systems. Complementarity and M-matrices. Global univalence theorem. Doubly stochastic matrices. Prerequisite: Stat 471 or 473 or the consent of the lecturer.

**577. Reliability Theory. 4 Hours.** Coherent structures, paths and cuts, modules, shape and properties of reliability function, association, classes of life distributions based on aging, dependence, multivariate models. Prerequisite: Stat 461.

**591. Advanced Topics in Statistics, Probability, and Operation Research. 4 Hours.** May be repeated for credit. Special topics. Topics drawn from areas such as: data analysis; Bayesian inference; nonlinear models; time series; computer-aided design; reliability models; game theory. Prerequisite: Approval of the department.

**593. Graduate Student Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in a learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.

**595. Research Seminar. 1 Hour.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Researchers and practitioners from academia, industry and government will present talks on topics of current interest. Prerequisite: Approval of the department.

**596. Independent Study. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Reading course sponsored by a faculty member. Prerequisites: Approval of the instructor and the department.

**598. Master's Thesis. 0 to 16 Hours.** S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master's thesis. Prerequisite: Approval of the department.

**599. Thesis Research. 0 to 16 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Prerequisite: Approval of the department.

## **Surgery (Surg)**

**597. Project Research. 0 to 16 Hours.** S/U grade only. Research investigation of problems in surgery. Prerequisite: Consent of the instructor.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. Research investigation of problems in surgery. Prerequisite: Consent of the instructor.

## **Theatre (Thtr)**

**423. Playwriting. 4 Hours.** Same as Engl 495. The development of scripts for stage performance. Prerequisites: Approval of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.

**444. Drama in Its Cultural Context I. 4 Hours.** Drama in its social and cultural context, through the seventeenth century.

**445. Drama in Its Cultural Context II. 4 Hours.** Drama in its social and cultural context, eighteenth to twentieth centuries.

**452. Performing the Classics I. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Techniques of performing Greek, Commedia dell'arte, and/or Elizabethan drama. Topics vary. Prerequisite: Grade of B or better in Thtr 262.

**453. Space, Action, Motivation. 4 Hours.** Techniques in the physicalization of performance. Focus on the body in space as both primary and integrated theatrical communication.

**458. Performing the Classics II. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Techniques of performing Restoration through nineteenth-century styles of drama. Topics vary. Prerequisite: Grade of B or better in Thtr 262.

**460. Theatre Architecture and Production. 4 Hours.** Seminar on aesthetic and technical problems presented by the interrelation of theatre, stage, audience and play. Field study of types of Chicago theatres and stages. Prerequisites: Thtr 150, and 250 or 255 or 444; or consent of the instructor.

**464. Special Projects in Theatrical Design. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Twentieth-century styles: design for the contemporary stage. Problems in conceptualization, realization, and execution. Prerequisites: Thtr 250 or Thtr 256; or Thtr 257 and Thtr 259; or graduate standing in theatre.

**465. Stage Direction. 4 Hours.** Exploration of conceptual, planning and implementation skills of the stage director from script implementation to rehearsal and performance. Performance projects required. Prerequisite: Grade of B or better in Thtr 161.

**466. Special Projects in Performance Training. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Training in varying advanced techniques of performance. Prerequisite: Consent of the instructor.

**470. Contemporary Performance Techniques. 4 Hours.** May be repeated for a maximum of 8 hours of credit. The relationship of contemporary theory and performance techniques with attention to both text and non-text based forms. Topics vary. Performance projects required. Prerequisite: Grade of B or better in Thtr 262; or graduate standing in theatre.

**472. Investigative Collaboration. 4 Hours.** May be repeated for a maximum of 8 hours of credit. Collaboration as the primary means for the theatrical creation. Production teams assigned to joint-production projects. Topics vary. Prerequisite: Grade of B or better in Thtr 262; or graduate standing in theatre.

**474. Internship. 3 to 8 Hours.** May be repeated for credit. Only 3 hours may be counted toward theatre major requirements. Students work in an approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. Prerequisites: 12 hours of upper-division courses in theatre, with a 3.00 grade point average (A=4.00) in those courses; recommendation of two faculty members and approval of the department obtained in the semester prior to internship.

**491. Study Abroad in Theatre. 0 to 16 Hours.** May be repeated for credit with the approval of the department. Study abroad within an approved foreign exchange program or department-sponsored program. Prerequisite: Approval of the department.

**498. Independent Study. 1 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Individual investigation of special problems that may be student-initiated or related to faculty research. May also be used for special University-sponsored projects, such as interdisciplinary seminars. Prerequisite: Approval of the department.

**502. Introduction to Research in Theatre. 4 Hours.** Focuses on the research directors and scholars need to do to make informed choices.

**521. Topics in Theatre History. 4 Hours.** May be repeated for a maximum of 8 hours credit. Varying topics of a scope sufficiently broad to illuminate general problems of theatrical style and convention and/or periodization and historical development.

**522. Theories of Theatre. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Nature of the theatrical experience. Emphasis on topics varies, for example theory of comedy; semiotics of theatre; dada, surrealism, expressionism, futurism. Prerequisites: At least 3 of the following: Thtr 209, 245, 262, 284, 425; or consent of the instructor.

**523. Special Topics in Dramatic Criticism. 4 Hours.** May be repeated for a maximum of 12 hours of credit. Intensive analysis of an individual critic or school, or critical history of an important play.

**596. Independent Research. 1 to 4 Hours.** May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Department approved research projects

not included in thesis research. Prerequisite: Consent of the director of graduate studies.

**597. Thesis Production. 0 to 8 Hours. S/U grade only.** Under guidance of an advisor and committee, the student creates a theatre or video production, together with a written explanation of the work's intended significance. Prerequisite: Approval of the faculty thesis production committee.

**598. Thesis Research. 0 to 16 Hours. S/U grade only.** Students may register for more than one section per term. Under guidance of an advisor and committee, the student develops and conducts a research project addressing a theatre problem of a basic or applied nature. Prerequisite: Approval of the faculty thesis-research committee.

## **Urban Planning and Policy (UPP)**

**403. Introduction to Urban Planning. 4 Hours.** Patterns of city growth, physical, socio-economic, and environmental issues. Contemporary planning issues. Future of cities. Prerequisite: Consent of the instructor.

**420. Great Cities: London & Chicago. 1 to 8 Hours.** Comparative investigation of urban, economic, social, and political issues in the two global cities. Includes classes, study, and living in London. Field work required. Prerequisite: Selection by the Office of Study Abroad admission committee.

**461. Urban and Regional Transportation Methods. 4 Hours.** Same as CEMM 404. Methods and models for analyzing and forecasting transportation requirements, costs, and capacities. Prerequisite: Consent of the instructor.

**470. Cohort Seminar for Urban Developers. 4 Hours.** Application of the financial calculator, use of spreadsheets, and other tools commonly used in real estate-based urban development projects. Prerequisite: Consent of the instructor.

**471. Housing and Community Development for Urban Developers. 4 Hours.** Housing policy at federal, state and local levels affecting urban housing markets. Emphasis on assessment of market conditions affecting community development decisions. Prerequisite: UPP 470 or consent of the instructor.

**472. Development Finance for Urban Developers. 4 Hours.** Key financial principles of real estate development, particularly those related to the financing of affordable housing. How to develop a real estate pro forma. Prerequisite: Consent of the instructor.

**473. Organizational Essentials for Urban Developers. 4 Hours.** Theory and practice of management in public and non-profit settings. Focus on developing communication, leadership and legal skills for each step in development. Prerequisite: Consent of the instructor.

**474. Community Development Process for Urban Developers. 4 Hours.** Developing affordable housing: development team, acquisition strategy, legal issues, construction management and project sustainability, as it pertains to different types of housing developments. Prerequisite: Consent of the instructor.

**475. Sustaining the Housing for Urban Developers. 4 Hours.** Introduces students to a range of management issues: property management and maintenance, resident relations and services, and financial/asset management as it relates to sustaining affordable housing. Prerequisite: Consent of the instructor.

**500. History and Theory of Urban Planning. 4 Hours.** Analysis of the development of the planning field and of the theories that have been developed for planning for change in the urban community.

**501. Urban Space, Place, and Institutions. 4 Hours.** Political and economic approaches to urban structure and change. Includes intergovernmental relations, administrative organization and planning initiatives in urban space and institutions. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

**502. Planning Skills: Computers, Methods, and Communication. 4 Hours.** Focus on the use of computers to learn methods and communication skills commonly used in planning practice. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

**503. Data Analysis for Planning and Management I. 4 Hours.** Basic introduction to data analysis techniques most commonly used in urban planning. Addresses issues of decision-making based on limited or imperfect information. Prerequisite: Consent of the instructor.

**504. Economic Analysis for Planning and Management. 4 Hours.** Basic micro, macro, and welfare economics theory; related analytical concepts including input-output, economic base, benefit cost. Economic forces which shape urban areas and affect public policy. Prerequisite: Consent of the instructor.

**507. Computer Topics in Urban Planning. 4 Hours.** Specialized computational abilities for various planning areas including data base, project scheduling, statistics, graphics, and simulations. Topics will vary each semester. Prerequisite: Graduate standing in the Urban Planning and Policy program.

**508. Geographic Information Systems for Planning. 4 Hours.** Same as Geog 589. Applications of Geographic Information Systems to urban planning and policy making. Prerequisite: Graduate standing in urban planning and policy or consent of the instructor.

**511. Resource and Expenditure Planning. 4 Hours.** Sources of governmental revenues with emphasis on local planning and administration. Legal and equity issues. Debt financing and management. Financial accounting. Pension fund management. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

**512. Evaluation Methods. 4 Hours.** Methods used to evaluate policies and programs; quasi-experimental designs, valuation problems, and emerging evaluation methods. Prerequisite: Consent of the instructor.

**513. Data Analysis for Planning and Management II. 4 Hours.** Advanced topics in data analysis and model building including specific models used in urban planning. Prerequisite: UPP 503.

**515. Joint Planning Studio. 4 Hours.** Analysis, evaluation and development of plans for clients. Prerequisites: UPP 500 and 503.

**516. Issues of Class and Race in Planning. 4 Hours.** Critically examines the significant role of race, class, ethnicity and gender as factors in planning public policy formation, implementation, and evaluation. Prerequisite: Consent of the instructor.

**517. Regional and Metropolitan-Wide Planning. 4 Hours.** History of regional planning. Prerequisite: UPP 500.

**518. Management Skills. 4 Hours.** Management theory and practice with particular focus on public and non-profit organizational settings. Political context of management, budgeting and professional communication.

**520. International Development I: Theory and Applications. 4 Hours.** Overview of international development theories and their practical applications. Particular emphasis is placed on globalization. Urban versions and applications of these theories. Prerequisite: Consent of the instructor.

**521. International Development II: Comparative Planning and Policies. 4 Hours.** Policies and practice of public sector planning and development in three regional areas of the world: Europe, South America, and Asia. Prerequisite: UPP 520 or consent of the instructor.

**522. International Development Planning Studio. 4 Hours.** Learning experience based on team work and the application of planning approaches to issues of development in an international perspective. Prerequisites: UPP 520 and 521 or consent of the instructor.

**525. International Development: Special Topics. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in international development planning. Prerequisite: Consent of the instructor.

**530. Economic Development I: Analysis. 4 Hours.** Theoretical perspectives, data, data sources and research techniques for analysis of regional, metropolitan and neighborhood economies. Prerequisite: UPP 504.

**531. Economic Development II: Planning. 4 Hours.** Overview of development strategies including financing, business development, industry retention and human resources; implementation and evaluation. Prerequisite: UPP 530.

**532. Current Perspectives on Economic Development. 4 Hours.** An examination of economic changes with specific reference to industrial transformation and the theoretical basis to these changes in order to clarify the policy debates. Prerequisites: UPP 504 and 530.

**533. Development Finance Analysis. 4 Hours.** Financial feasibility analysis for residential, commercial, and industrial projects. Financial valuation and accounting principles, legal interests in real



estate, and tax issues affecting cash flow and returns on investment. Prerequisite: UPP 504.

**535. Economic Development: Special Topics. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in economic development. Prerequisite: Consent of the instructor.

**536. Urban Employment Planning. 4 Hours.** The importance of employment as a focus in planning and policy making. History, theories and methodologies of urban markets; labor market analysis methodologies and emergent public policies. Prerequisite: UPP 504 or consent of the instructor.

**537. Economic and Environmental Planning. 4 Hours.** Analytical and economic methods for environmental planning and management. Applications to selected problems. Prerequisite: UPP 504 or 554.

**540. Community Development I: Theory. 4 Hours.** Critically examines community development as a field of practice, policy intervention, implementation and analysis; emphasis on community and social dynamics of disadvantaged groups. Prerequisite: Consent of the instructor.

**541. Community Development II: Practice. 4 Hours.** Examines the methods and techniques used or adapted in community development as a field of planning practice, analysis and evaluation: emphasis on community based settings, applications and foci. Prerequisite: Consent of the instructor.

**542. Metropolitan Housing Planning. 4 Hours.** Urban housing market structure and dynamics; impacts of government housing policy on market; development of local housing plans. Prerequisite: UPP 504 or consent of the instructor.

**543. Planning for Community-Based Health and Human Services. 4 Hours.** Investigates the needs of special populations such as the elderly or mentally ill, the role of the planner in serving these groups and community based strategies to meet needs.

**545. Community Development: Special Topics. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in community development. Prerequisite: Consent of the instructor.

**546. Health Planning Perspectives and the Health Care System. 4 Hours.** Evolution of health care planning; organizational and political contexts for professional practice; current issues in health policy and service delivery planning. Prerequisite: Consent of the instructor.

**547. Community Organization Practice. 4 Hours.** Critically examines the context, development, status, and problematics of organizing groups within communities of place, conditions and interest at various levels of analysis, relative to public formation, implementation and evaluation. Prerequisites: UPP 540 and 541; and consent of the adviser and the instructor.

**550. Physical Planning I: Theoretical Foundations. 4 Hours.** Physical form, economic characteristics, social qualities and government structure of cities, suburbs and regions; theories of urban spatial organization and planning. Prerequisite: Consent of the instructor.

**551. Physical Planning II: Methods. 4 Hours.** Fundamentals of construction and infrastructure of cities and regions, including site engineering and landscape architecture, natural environmental factors, utilities and infrastructure, cost/benefit analysis, and context of local government and planning process. Prerequisite: UPP 550.

**552. Physical Planning III: Studio. 4 Hours.** Analysis, evaluation, and development of land use and urban design plans for selected projects and clients. Prerequisite: UPP 551.

**553. Land Use Law. 4 Hours.** Legal constraints on land use control; constitutional and statutory principles and judicial review. Prerequisite: UPP 558.

**554. Environmental Planning. 4 Hours.** The relationship of federal and state environmental policies and legislation to urban and regional planning efforts. Prerequisite: Consent of the instructor.

**555. Physical Planning: Special Topics. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for

intensive analysis in such areas as housing and urban design. Prerequisite: Consent of the instructor.

**556. Urban Design. 4 Hours.** Methods and tools for analysis, policy making and evaluation of urban spaces, including theoretical approaches and trends, design elements, social dimensions, methods, policy formulation, computer applications, and project examples. Prerequisite: Consent of the instructor.

**557. Site Planning. 4 Hours.** Quantitative and qualitative tools for analysis and evaluation of site plans, including standards of site plans, spreadsheet computer models, elements of site design, landscape architecture, and red penciling site plans.

**558. Land Use Planning. 4 Hours.** Urban land use planning strategies and various land use control techniques which can be employed to carry out development policies; social implications of land use policy and practice. Prerequisite: Consent of the instructor.

**560. Urban Transportation I: Introduction. 4 Hours.** Transportation planning and linkages between it and urban land use and regional economic development. Recent trends, traditional problems and emerging issues.

**561. Urban Transportation II: Policy and Methods. 4 Hours.** Formation and implementation of transportation policy at the national, regional and local levels. Students will prepare an in-depth study of a major policy issue. Prerequisite: UPP 560 or consent of the instructor.

**562. Urban Transportation III: Laboratory. 4 Hours.** Software packages for urban transportation planning, transportation GIS and air quality modeling. Heavy reliance on case studies. Prerequisite: UPP 561 or consent of the instructor.

**563. Transportation Management. 4 Hours.** Transit system planning, scheduling, pricing policy, and management; traffic control techniques and demand management; paratransit alternatives. Prerequisite: UPP 560.

**564. Programming and Implementation of Transportation Projects. 4 Hours.** Case study analyses of the context for and techniques used in the planning, programming and implementation of transportation improvement projects. Prerequisite: UPP 560 or consent of the instructor.

**565. Transportation: Special Topics. 1 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Examination of specific and current problems in urban and regional transportation. Topics to be determined at the time the course is offered. Prerequisites: UPP 560 and consent of the instructor.

**566. Advanced Methods of Urban Transportation Planning I. 4 Hours.** Transportation planning strategies, procedures for analyzing travel patterns, travel demand models, trip distribution models and network equilibrium. Prerequisites: UPP 461, 560 and 585, or consent of the instructor.

**567. Advanced Transportation Planning II. 4 Hours.** Same as CEMM 504. Analysis and design of transportation networks using methods from mathematical programming and optimal control theory; integration of travel choice models with urban location and network design models. Prerequisite: UPP 566 or consent of the instructor.

**568. Intelligent Transportation Systems Planning. 4 Hours.** Basic concepts in ITS, overview of national ITS architecture, ITS planning methods, design issues, strategic deployment planning, cost benefit evaluation. Case study approach. Prerequisite: UPP 562.

**583. Advanced Planning Theory. 4 Hours.** Study of theoretical ideas and debates about planning; the rational model and its competitors; critical review of planning methods and practice; composing alternative plans. Prerequisite: Consent of the instructor.

**584. Methods of Policy Analysis. 4 Hours.** Same as PPA 584. Analytic, allocative, and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. Prerequisite: Consent of the instructor.

**585. Data Analysis Methods: Regression Analysis. 4 Hours.** Theory and methods of regression analysis are covered with emphasis placed on applications to different fields, chosen based on student interest. Prerequisite: UPP 513 or consent of the instructor.

**591. Professional Practice Experience. 4 Hours.** Reviews issues and problems in professional practice; analyzes prerequisites for rational, strategic and ethical planning; considers career

options; and defines professional goals. Includes professional experience for students without professional planning experience. Prerequisite: Graduate standing in urban planning and policy and an approved internship agreement or waiver of the internship.

**593. Independent Research in Urban Planning and Policy. 1 to 8 Hours.** May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the guidance of a faculty adviser. Prerequisite: Consent of the instructor.

**594. Topics in Urban Planning and Policy. 1 to 4 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of selected planning problems or policy issues. Prerequisite: Consent of the instructor.

**596. Independent Study in Urban Planning and Policy. 1 to 4 Hours.** May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of topic selected by student under the guidance of the faculty adviser. Prerequisite: Consent of the instructor.

**597. Master's Project Research. 0 to 4 Hours.** S/U grade only. Preparation of plan, research report, or other document which demonstrates readiness for professional planning responsibility. Prerequisite: Open only to degree candidates, upon approval of student's faculty adviser.

**598. Master's Thesis Research. 0 to 16 Hours.** S/U grade only. Preparation of a major research paper under the guidance of a faculty committee. Prerequisite: Open only to degree candidates, upon consent of the director of graduate studies.

**599. PhD Thesis Research. 0 to 16 Hours.** May be repeated for credit. S/U grade only. Individual study and research. Prerequisite: Open only to degree candidates, upon approval of topic by dissertation committee.

## **Women's Health (NuWH)**

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**450. Women and Mental Health Nursing. 3 Hours.** Same as GWS 450 and NuPs 450 and NuSc 450. Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. Prerequisite: Consent of the instructor.

**455. Women's Health: A Primary Health Care Approach. 3 Hours.** Same as CHSc 456 and NuPH 455 and NuSc 455. Health promotion and disease prevention in women's health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

**507. Scientific Basis for Women's Health and Perinatal Nursing I. 2 Hours.** Same as NuMC 507. Focuses on anatomy, physiology and endocrinology of reproduction, pregnancy, labor and birth as scientific basis for women's health and perinatal nursing. Prerequisite: Consent of the instructor.

**517. Health Care of Women I. 5 Hours.** Same as NuMC 517. Health care of women from adolescence to senescence with emphasis on human sexuality, control of fertility, sexually transmitted diseases, and antepartum care. Prerequisite: Credit or concurrent registration in NuMC 508 or consent of the instructor.

**518. Health Care of Women II. 5 Hours.** Same as NuMC 518. Health care of women from adolescence to senescence with emphasis on intrapartum, postpartum, common gynecologic problems, and management of other common conditions. Prerequisite: NuWH 517 or consent of the instructor.

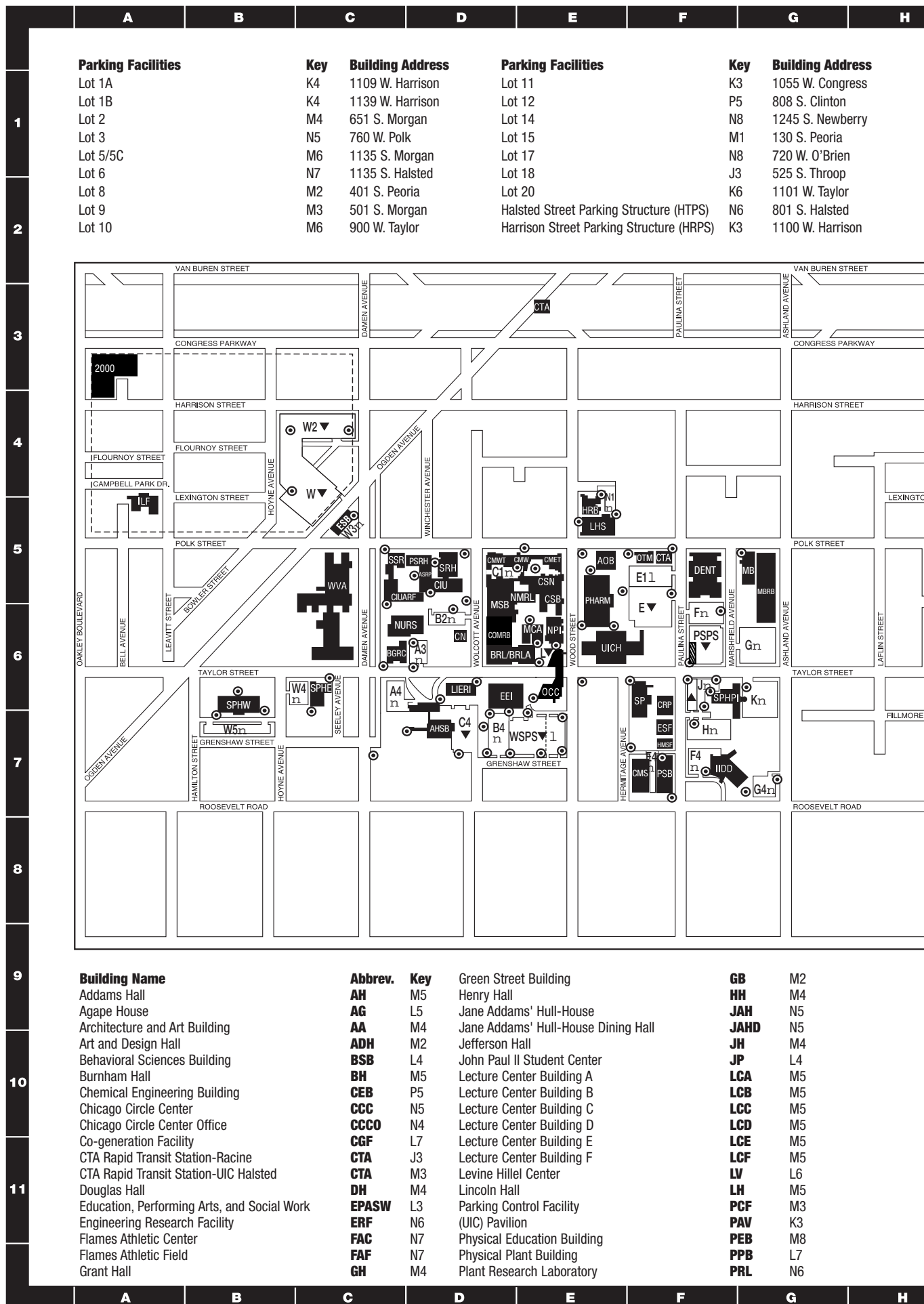
**550. Issues for Research and Practice in Women's Health. 3 Hours.** Same as NuAS 550 and NuSc 550. Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women's health care practice are developed as a basis for research. Prerequisite: Consent of the instructor.

**555. Theories and Methods in Women's Health Nursing Research. 3 Hours.** Same as NuSc 555. Critical analysis of theoretical and methodological approaches in women's health nursing research. Emphasis on evaluation schema useful to researchers. Prerequisites: NuWH 550 and consent of the instructor.

**565. Advanced Research in Women's Health. 1 to 2 Hours.** Same as NuPH 565 and NuSc 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique on-going and developing research. Prerequisite: Consent of the instructor.

**570. International Dimensions in Women's Health. 3 Hours.** Same as NuPH 570 and NuSc 570. Critical examination of the health of women from a global perspective. Emphasizes resources and strategies nurse researchers use to monitor women's health across cultures and countries. Prerequisite: Consent of the instructor.

**575. Minority Women's Health Nursing. 3 Hours.** Same as NuSc 575. Theoretic and descriptive overview of the health concerns and health conditions of women from ethnic/racial minority backgrounds with implications for nursing research and practice. Prerequisite: Consent of the instructor.





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<b>TSB</b>	K6
<b>TN4</b>	M9
<b>TC</b>	N4
<b>UIC</b>	L3
<b>TF</b>	M9
<b>CPYC</b>	M4
<b>UH</b>	M4
<b>CUPPAH</b>	M3
<b>UTB</b>	L7
<b>WC</b>	M2

## How to Reach UIC

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### By Car

#### From the north

Take the Kennedy Expressway (I-90/94) east-bound to the Eisenhower Expressway (I-290) west-bound.

- East side: Keep to the right, exit immediately at Morgan Street, south to the campus.
- West side: Exit at Ashland Avenue, south to Taylor Street, west to the campus.

#### From the south

Take the Dan Ryan Expressway (I-90/94) west-bound to Roosevelt Road.

- East side: West on Roosevelt Road to Halsted Street.
- West side: West on Roosevelt Road to Ashland Avenue, north to Taylor Street, west to the campus.

#### From the east

Take Harrison Street or Roosevelt Road west.

- East side: West on Harrison Street or Roosevelt Road to Halsted Street.
- West side: West on Harrison Street to Ashland Avenue, south to Taylor Street, west to the campus.
- or
- West on Roosevelt Road to Ashland Avenue, north to Taylor Street, west to the campus.

#### From the west

Take the Eisenhower Expressway (I-290) east-bound.

- East side: Exit at Racine Avenue, south to the campus.
- West side: Exit at Ashland Avenue, south to Taylor Street, west to the campus.

## Public Transportation

### RTA

The Regional Transportation Authority (RTA) is a special service unit of local government that operates public transportation systems for the six counties of northeastern Illinois—Cook, DuPage, Kane, Lake, McHenry, and Will. The RTA system includes the Chicago Transit Authority (CTA), which provides bus and rapid transit service within the city of Chicago and to 38 suburban municipalities; Metra, the commuter rail division, which provides commuter rail service connecting downtown

Chicago with 68 Chicago locations and 100 suburban communities; and Pace, the suburban bus division, which provides fixed-route bus, paratransit, and vanpool services to approximately 200 communities throughout the suburbs and from suburban locations to the city of Chicago.

The RTA Travel Information Center is open from 5:00 a.m. to 1:00 a.m. daily. For transit information or to order maps or timetables, call 836-7000 from any northeastern Illinois area code (312, 630, 708, 773, 815, or 847), or log on to their Web site at [www.rtachicago.com](http://www.rtachicago.com).

### CTA

The UIC campus is served by the CTA's Blue Line (O'Hare/Forest Park and 54/Cermak branches) rapid transit trains and several bus routes. West-side train service includes stops at the handicapped-accessible 54/Cermak train Polk Street station and the O'Hare/Forest Park train Medical Center station. East-side train service includes both O'Hare/Forest Park and 54/Cermak stops at Racine and UIC/Halsted stations. Connections to all other CTA rail lines can be made in the Chicago Loop. For information on CTA service, call 1-888-YOUR-CTA (1-888-968-7282), or log on to their Web site at [www.transitchicago.com](http://www.transitchicago.com).

### Metra

Metra's system of 12 lines serves 230 stations in the six-county area and connects with Pace and CTA buses and trains. For information on Metra service, call the RTA Travel Information Center at 836-7000 from any northeastern Illinois area code (312, 630, 708, 773, 815, or 847), or log on to their Web site at [www.metrarail.com](http://www.metrarail.com).

UIC provides commuter bus service between the Ogilvie Transportation Center (formerly North Western Station), Chicago Union Station, and the UIC campus. Commuter bus tickets are sold in books of 25 by the cashiers in Chicago Circle Center and the Marshfield Building, and at the Campus Information Center in the Chicago Illini Union.

From the Ogilvie Transportation Center (formerly North Western Station) and Union Station, commuters may also use CTA bus No. 60 (Blue Island-26th Street) to reach the UIC campus. From the LaSalle Street Station and the Randolph Street Station, Metra commuters may take a west-bound Blue Line (Congress/Douglas A or B) train to one of the campus stops.

### Pace

For information on Pace service, call the RTA Travel Information Center at 836-7000 from any northeastern Illinois area code (312, 630, 708, 773, 815, or 847), or log on to their Web site at [www.pacebus.com](http://www.pacebus.com).

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