

## Contents

A Message from the Dean .....	2	Communication (MA) .....	62
Academic Calendar .....	3	Criminal Justice (MA, PhD) .....	63
The University .....	5	Earth and Environmental Sciences (MS) .....	64
Graduate College .....	7	English (MA, PhD) .....	65
Admissions .....	7	Environmental Geography (MA) .....	66
Financial Aid .....	9	French (MA) .....	67
Enrollment .....	12	German (MA, PhD is joint with UIUC) .....	68
Degree Requirements .....	15	Hispanic Studies (MA, PhD) .....	68
University Regulations .....	17	History (MA, PhD) .....	70
Graduate Faculty .....	22	Linguistics (MA) .....	71
College of Architecture and the Arts .....	34	Mathematics (MA, MS, DA, PhD) .....	72
Architecture (MARCH) .....	34	Philosophy (MA, PhD) .....	73
Art History (MA) .....	34	Physics (MS, PhD) .....	74
Art Therapy (MA) .....	35	Political Science (MA) .....	75
Electronic Visualization (MFA) .....	35	Psychology (MA, PhD) .....	76
Film/Animation/Video (MFA) .....	36	Public Policy Analysis - Pol. Sci. (PhD) .....	
Graphic Design (MFA) .....	36	Slavic Languages and Literatures (PhD) .....	77
Industrial Design (MFA) .....	37	Slavic Studies (MA) .....	78
Photography (MFA) .....	38	Sociology (MA, PhD) .....	79
Studio Arts (MFA) .....	38	College of Medicine .....	81
Theatre (MA) .....	39	Anatomy and Cell Biology (MS, PhD) .....	81
College of Associated Health Professions .....	40	Biochemistry and	
Biomedical Visualization (MAMS) .....	40	Molecular Biology (MS, PhD) .....	81
Disability and Human Development (MS) .....	40	Molecular Genetics .....	82
Disability Studies (PhD) .....	41	Health Professions Education (MHPE) .....	82
Human Nutrition and Dietetics (MS, PhD) .....	41	Microbiology (MS, PhD) .....	83
Kinesiology (MS, PhD) .....	42	Pathology (MS, PhD) .....	84
Medical Laboratory Sciences (MS) .....	43	Pharmacology (MS, PhD) .....	84
Occupational Therapy (MS) .....	43	Physiology and Biophysics (PhD) .....	85
Physical Therapy (MS) .....	44	Surgery (MS) .....	86
College of Business Administration .....	45	College of Nursing .....	87
Accounting (MS) .....	45	Nursing Science (MS) .....	87
Business Administration (PhD) .....	45	College of Pharmacy .....	89
Economics (MA) .....	46	Forensic Sciences (MS) .....	89
Management Information Systems (MS) .....	47	Medicinal Chemistry (MS, PhD) .....	89
Public Policy Analysis - Economics (PhD) .....	47	Pharmacognosy (MS, PhD) .....	90
College of Dentistry .....	48	Pharmacy (MS, PhD) .....	90
Oral Sciences (MS) .....	48	School of Public Health .....	92
College of Education .....	49	Public Health Sciences (MS, PhD) .....	92
Education (Curriculum and Instruction) (PhD) .....	49	Jane Addams College of Social Work .....	94
Educational Policy and Administration (PhD) .....	49	Social Work (PhD) .....	94
Instructional Leadership (MED) .....	50	College of Urban Planning and	
Leadership and Administration (MED) .....	51	Public Affairs .....	95
Special Education (MED) .....	51	Public Administration (MPA) .....	95
College of Engineering .....	53	Public Policy Analysis - UPP (PhD) .....	
Bioengineering (MS, PhD) .....	53	Urban Planning and Policy (MUPP) .....	96
Chemical Engineering (MS, PhD) .....	53	Graduate Courses .....	98
Civil Engineering (MS, PhD) .....	54		
Electrical Engineering			
and Computer Science (MS, PhD) .....	54		
Geotechnical Engineering (PhD) .....	55		
Industrial Engineering (MS) .....	56		
Materials Engineering (PhD) .....	57		
Mechanical Engineering (MS, PhD) .....	57		
College of Liberal Arts and Sciences .....	59		
Anthropology (MA, PhD) .....	59		
Biological Sciences (MS, DA, PhD) .....	60		
Chemistry (MS, PhD) .....	61		

## A Message from the Dean

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The knowledge explosion and recent technological advances demonstrate the compelling need for advanced education. The deeper understanding of science, arts, and humanities gained from graduate education will enrich the life of our students and society as a whole. Graduate research training not only equips students with analytical abilities and skills, but also teaches how to think broadly while at the same time becoming expert in a specialized field. And more importantly, graduates have an excellent chance of becoming leaders in their chosen fields, contributing to our society intellectually as well as economically.

The programs offered by the Graduate College of the University of Illinois at Chicago educate and train students using the most advanced knowledge in all disciplines. Masters' degree programs offer preparation for beginning research and scholarship, and practice; and Ph.D. programs provide students with the research training that serve as the basis for careers as scientists, professors, and other specialists.

Students in UIC's graduate programs are educated by faculty members who are national and international leaders in their fields. Our superb faculty, which comes to us from diverse cultural backgrounds, had earned for UIC the prized designation of a Research I institution (accorded by the Carnegie Foundation), one of only eighty-eight such institutions nationwide.

With a dedicated faculty and staff committed to excellence in all fields of graduate education, I invite you to make the University of Illinois at Chicago your choice for graduate education. I welcome you to UIC.

Mi Ja Kim  
Vice Chancellor for Research  
Dean of the Graduate College

# Academic Calendar

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## *Fall Semester (1998)*

August 24, M .....	Instruction begins.
September 2, F .....	Last day to complete registration and last day to add a course. Last day to drop a course(s) offered by the College of Business Administration, Engineering, Liberal Arts and Sciences.
September 7, M .....	Labor Day Holiday. No classes.
October 2, F .....	Last day to drop a course(s): all colleges except the Colleges of Business Administration, Engineering, or Liberal Arts and Sciences.
October 30, F .....	Last day to file for graduation this term.
November 23, M .....	Last day to submit approved thesis/dissertation for graduation this term.
November 26—27, Th—F .....	Last day for Graduate College to receive certificates of approval for master's project for graduation.
December 4, F .....	Thanksgiving holiday. No classes.
December 7—11, M—F .....	Instruction ends.
December 12, Sa .....	Final examinations.
	Semester ends.

## *Spring Semester (1999)*

January 11, M .....	Instruction begins.
January 18, M .....	Martin Luther King Jr. holiday. No classes.
January 22, 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, Liberal Arts and Sciences, and undergraduate Nursing.
February 19, F .....	Last day to drop a course(s) offered by all colleges except the Colleges of Business Administration, Engineering, or Liberal Arts and Sciences.
March 15—19, M—F .....	Last day to file for graduation this term.
March 19, F .....	Spring vacation. No classes.
April 19, F .....	Last day to submit approved thesis/dissertation for graduation this term.
April 30, F .....	Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
May 5—9, M—F .....	Instruction ends.
May 8, Sa .....	Final examinations.
May 9, Su .....	Semester Ends.
	Commencement.

## *Summer Session (1999)*

May 31, M .....	Memorial Day. No classes.
June 1, M .....	Instruction begins.
June 4, 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, or Liberal Arts and Sciences.
July 2, F .....	Last day to drop a course offered by colleges other than Business Administration, Engineering, or Liberal Arts and Sciences.
July 5, M .....	Last day to file for graduation this term.
July 9, F .....	Independence Day holiday. No classes.
July 16, F .....	Last day to submit approved thesis/dissertation for graduation this term.
July 21, W .....	Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
July 22—23, Th—F .....	Instruction ends.
July 24, Sa .....	Final examinations.
	Summer session ends.

### *Fall Semester (1999)*

August 10-13 T-F .....	M-1 orientation (College of Medicine).
August 16, M .....	M-1 and M-2 classes begin (College of Medicine).
August 23, M .....	Instruction begins.
September 3, F .....	Last day to complete late registration and last day to add a course. Last day to drop a course offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.
September 6, M .....	Labor Day holiday. No classes.
October 1, F .....	Last day to drop a course 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 29, F .....	Last day to submit approved thesis/dissertation for graduation this term.
November 22, M .....	Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
November 25—26, Th—F .....	Thanksgiving holiday. No classes.
December 3, F .....	Instruction ends.
December 6—10, M—F .....	Final examinations.
December 11, Sa .....	Semester ends.

### *Spring Semester (2000)*

January 3, M .....	M-1 and M-2 classes begin (College of Medicine).
January 10, M .....	Instruction begins.
January 17, M .....	Martin Luther King Jr. holiday. No classes.
January 21, F .....	Last day to complete registration and last day to add a course. Last day to drop a course offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.
February 18, F .....	Last day to drop a course 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 13—17, M—F .....	Spring vacation. No classes.
March 17, F .....	Last day to submit approved thesis/dissertation for graduation this term.
April 17, M .....	Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
April 28, F .....	Instruction ends.
May 1-5, M-F .....	Final examinations.
May 6, Sa .....	Semester ends.
May 7, Su .....	Commencement.

### *Summer Session (2000)*

May 29, M .....	Memorial Day holiday. No classes.
May 30, T .....	Instruction begins.
June 2, F .....	Last day to complete registration and last day to add a course. Last day to drop a course offered by the Colleges of Business Administration, Engineering, and Liberal Arts and Sciences.
June 30, F .....	Last day to drop a course 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 3, M .....	Last day to submit approved thesis/dissertation for graduation this term.
July 4, T .....	Independence Day holiday. No classes.
July 14, F .....	Last day for Graduate College to receive certificates of approval for master's project for graduation this term.
July 19, W .....	Instruction ends.
July 20—21, Th—F .....	Final examinations.
July 22 Sa .....	Session ends.

## Board of Trustees of the University of Illinois

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## 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 that 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 in the Office of the Chancellor, (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 Schools of Social Work, 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)	116 Associated Health Professions	(312) 413-5325
Counseling Center	2010 Student Services Building	(312) 996-3490
Family Practice Center (East side)	1100 University Hall	(312) 996-3388
Family Practice Center (West side)	193 Associated Health Professions	(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	220 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 W. Polk	(312) 413-0403
Parking (three offices)	1180 Student Services Building	(312) 413-9020
	217 Student Residence Hall	(312) 413-5850
	701 Chicago Circle Center	(312) 413-5832
Records and Registration	1200 Student Services Building	(312) 996-4350
Disability Services	1190 Student Services Building	(312) 413-2183
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 Library	801 South Morgan	(312) 996-2726

## Centers, Institutes, and Laboratories

Biologic Resources Laboratory	1840 W. Taylor	(312) 996-7040
Computer Center	2267 SEL	(312) 413-0003
Disability and Human Development, Institute on	436 IIDD	(312) 413-1647
Electronic Visualization Laboratory	2036 ERF	(312) 996-3002
Energy Resources Center	1227 SEO	(312) 996-4490
Institute for the Humanities	Basement, SH	(312) 996-6354
Midwest AIDS Training & Education Center	173 CME	(312) 996-1373
Research Resources Center	835 S. Wolcott	(312) 996-7600
Research Services, Office of	304 AOB	(312) 996-2862
Social Science Data Archives	B111 BSB	(312) 996-7742
Social Science Research, Office of	B111 BSB	(312) 996-6439
Survey Research Laboratory	615 ALHS	(312) 996-5300
Urban Economic Development, Center for	2100 ALH	(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
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

601 S. Morgan (M/C 192)  
Room 606 UH  
Chicago, IL 60607-7106

Phone: (312) 413-2550  
Fax: (312) 413-0185  
Email: [gradcoll@uic.edu](mailto:gradcoll@uic.edu)  
Home Page: <http://www.uic.edu/depts/grad/>

Vice Chancellor for Research and Dean of the Graduate College: Mi Ja Kim  
Executive Associate Deans: Clark Hulse, Robert Kelley  
Associate Dean: Amy Levant  
Visiting Assistant Dean: Katrina Myers Caldwell

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 Public Health, the Master of Business Administration, 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

Eleven types of master's degrees are offered through the Graduate College at UIC: the Master of Architecture, the Master of Arts, the Master of Associated Medical Sciences, 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, social work, and public health. Information on these programs is available through the College of Business, the Jane Addams College of Social Work, and the School of Public Health.

## 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 (Nursing); MPH/MS (Nursing); MBA/MS (Accounting); MBA/MA (Economics); 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 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 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 3.75 (A=5.00) 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 is required by the Graduate College; many departments have a higher minimum. 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 3.75 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 8 semester hours of earning the baccalaureate. 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 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 for 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 8 semester hours of earning the baccalaureate. 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 webpage. 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 Social Work, Public Health and the MBA program 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.

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 Social Work and the MBA program 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.

Applicants to the Social Work and the MBA 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. 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. 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. 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 non-degree 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 is required by the Graduate College; many departments have a higher minimum. 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 file a Request for Change to Degree Status form with the Office of Admissions and Records to initiate the degree admission process. 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 between the Graduate College, the School of Public Health, the MBA Program, and the Master of Social Work Program. Complete instructions and deadlines are detailed on the back of the form.

## Financial Aid

The University of Illinois at Chicago offers six basic types of financial aid for graduate students: fellowships, assistantships, tuition and 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. 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 (ie. 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 a monthly stipend of \$833.33 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 masters 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 (6 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:* A monthly stipend and a tuition and service fee waiver for the first two years of support from the Graduate College. The academic program must provide financial support for the same number of years and at the same level of support as normally paid in the department.

*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. Applicants must also be a citizen or permanent resident of the United States.

*Application Procedures:* Applicants should submit an *Application for Graduate Appointment* to their academic program.

*Registration Requirements:* At least 12 hours each semester (six in summer).

#### **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:* \$1,000 per month stipend and a tuition and service fee waiver. The award is renewable for up to two years of support. Once the student accepts the Dean's scholar award, the graduate program is committed to continue support of the student until graduation.

*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 50 percent time.

*Application Procedures:* Each doctoral program may nominate one student only for the award. The nominations are reviewed by the Graduate College Awards Committee, and their recommendations forwarded to the Dean, who makes the final selections. The application form and

requirements are separate from those used for University Fellowships. Consult your director of graduate studies for information on application procedures and deadlines.

*Registration Requirements:* At least 12 hours each semester (6 in summer).

#### **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:* A monthly stipend and a tuition and service fee waiver. 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:* Applicants should submit an *Application for Graduate Appointment* to their academic program.

*Registration Requirements:* At least 12 hours each semester (6 in summer).

#### **CIC/GE Predoctoral Fellowships Program in Science, Mathematics, and Engineering**

UIC cooperates with the Committee on Institutional Cooperation (CIC) and the GE Fund to award fellowships to students who have participated in summer research programs like the SROP. The CIC/GE fellowship is designed to increase the percentage of underrepresented minority groups among those who hold PhD degrees in physical sciences, mathematics, or engineering disciplines.

#### **Amount**

The award provides full tuition and an annual stipend of \$15,000 for one year. The Graduate College agrees to provide one additional year of support. The student's program must agree to provide additional years of support (e.g., fellowship, assistantship, or traineeship).

#### **Eligibility**

Underrepresented minority groups, specifically American Indians, African Americans, Mexican Americans and Puerto Ricans, are eligible for this fellowship. Applicants must be citizens of the United States. Currently enrolled Graduate students at CIC university campuses are not eligible to apply.

#### **Application Procedures**

Contact the Graduate College or the CIC Predoctoral Fellowships Program Office, 111 Kirkwood Hall, Indiana University, Bloomington, Indiana 47405 (1-800-457-4420) for application materials and/or more information.

#### **Registration Requirements**

At least 12 hours each semester (six in summer).

#### **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**

\$10,000 stipend for a 12 month appointment and a tuition and service fee waiver. 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 (6 in summer).

### **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:** \$13,000 stipend for a twelve month appointment; a yearly books/supplies/travel allowance of \$1,500; and a tuition and service fee waiver.

**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 (6 in summer).

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

**Amount:** In addition to the \$5,000 award (which is dispersed by the Office of Student Financial Aid in two equal payments during the fall and spring semesters), the Graduate College provides a tuition and service fee waiver for the year (including summer term).

**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 American 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 (6 in summer).

### **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 \$9000; 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 (8) 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 (6 in the summer term). Waiver recipients may accept part-time employment, not to exceed twenty 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 6 hours in the summer term) the waiver is rescinded and the student is billed the tuition and service fee.

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

#### **Minority Academic Partnership Plan**

This program is designed to increase the participation and success of traditionally underrepresented minority students in programs leading to academic careers. Participants are guaranteed fellowship and/or assistantship support.

**Amount:** Varies by award; each award includes a stipend of at least \$8000 and a tuition and service fee waiver. Awards are in the form of a fellowship and/or assistantship appointment.

**Eligibility:** African-American, Hispanic-American, and Native American students who received their bachelor's degree from the University of Illinois. Applicants must have an undergraduate grade point average of at least 3.75 (A=5.00) and be admitted to a graduate program leading to the PhD or equivalent degree, with plans to pursue university teaching and research.

**Application Procedures:** Submit an *Application for Graduate Appointment* directly to your academic program.

**Registration Requirements:** Varies by type of appointment. For fellowships, at least 12 hours per semester (6 in summer); for assistantships, at least 8 hours per semester (3 in summer).

#### **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, Room Suite 1800, 1200 W. Harrison, (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 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 Progress Index 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 Progress Index (GPI)—Degree GPA

The GPI (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 GPI 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 GPI. However, grades earned through the CIC Traveling Scholars Program are included in the UIC GPI. 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 GPI has fallen below the minimum standard of 4.00. Students have two terms of enrollment (including summer, if registered) after the term in which their GPI falls below 4.00 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 (e.g. the GPI 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 4.00 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 (6 in summer).

**Tuition-and-Service-Fee-Waiver Holders:** Must register for at least 12 hours of credit per semester of award (6 in summer).

**Assistantship Holders:** Must register for at least 8 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 3 hours during that term. Some graduate programs may require registration for more than 8 hours per term and/or summer registration. There are no tuition and service-fee waiver benefits for students employed with less than 25% or more than 67% appointment. Assistants who qualify for a Spring tuition and service fee waiver automatically receive a summer waiver if registered in at least 3 hours in summer unless holding a summer appointment above 67%.

**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 8 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 (6 hours in summer).

### Grades

The following grades are used:

A—5 grade points per credit hour.

B—4 grade points per credit hour.

C—3 grade points per credit hour.

D—2 grade points per credit hour (not accepted as degree credit).

E—1 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 graduate progress index.

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 re-apply to Graduate College and be re-admitted 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 coursework, examinations, and all 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 once per year (Option B) exists for some doctoral students. 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 progress index. 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 Post-Secondary 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 progress index 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 32–47 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 coursework 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 alone.

#### 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 its transfer recommendations to the Graduate College. The petition must show the courses recommended for transfer by the graduate program and the number of semester hours of credit from an accredited institution, 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.

#### *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 Post Secondary 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 GPI. 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.

#### Coursework

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 9 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, or 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 student must earn at least 5 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.

#### 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.

##### Coursework

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, and who have completed all degree requirements except the dissertation, and who do not wish to register for additional coursework, 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); or

Option B: Must petition for each renewal and specify Option B. Only the range IV tuition is changed. 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 each academic year for Option B by the 10th day of the term (5th 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 disserta-

tion research, and passing it constitutes formal Admission to Candidacy. The examination serves as the last major step toward the Ph.D. 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 Ph.D. 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 coursework, 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 5 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 members' 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 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 (M/C 602)  
809 S. Marshfield Avenue  
Chicago, Illinois 60612-7227  
(312) 996-8670

### *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). 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 S. Marshfield Avenue, Phone: (312) 996-8670.

### *Student Disciplinary Procedures*

The Student Disciplinary Procedures provide a mechanism for review when a student (December 1985) 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 University of Illinois HMO 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 HMO fee.

Students who present evidence of equivalent medical insurance coverage to that offered by the HMO 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 place 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-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. Emeriti.

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 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 Admissions and Records:

Student Services Building (M/C 018)

Office of Admissions and Records

University of Illinois at Chicago

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.

UIHMO, Inc./CampusCare Program

*Deadline to waive:* 31st day of the semester.

UIHMO/CampusCare is the student insurance at UIC. Eligible registered students are automatically enrolled in the CampusCare plan and assessed the HMO fee as part of their tuition. CampusCare is a comprehensive health care benefit plan designed specifically for college students. Students receive primary care at Family Medicine Centers located on the East and West sides of campus. Inpatient and emergency services are provided at the University of Illinois Medical Center (1740 West Taylor).

All incoming new students are mailed a welcome packet by UIHMO containing information about the CampusCare Plan, eligibility, how to obtain medical services, and related deadlines. This information is also available at UIHMO Administration.

**Waiver of the Student HMO Fee:** (Deadline to submit application is the 31st day of the semester). The UIHMO/CampusCare coverage may be waived by submitting a completed Petition for Waiver, available at UIHMO Administration or at the Student Information Network Center (SINC), and proof of comparable health insurance (i.e., a copy of their health insurance card). Students submitting the required information by the 31st day of the semester will be granted a waiver of the HMO fee for the current semester. Once a waiver of the HMO fee has been credited to the student's account, it is valid for all future semesters.

**Reinstatement of the UIHMO Fee:** A student may seek to reinstate the UIHMO/CampusCare coverage by submitting a completed and signed Petition for Reinstatement form, including a Health Certificate and medical records, if required, to UIHMO Administration. Reinstatement must be approved by the Medical Director and is not guaranteed.

**Dependent Coverage:** Students may apply to purchase UIHMO/CampusCare coverage for their eligible dependents by submitting to UIHMO an enrollment application, proof of relationship (e.g., marriage license, birth certificate), and a UIHMO Health Certificate if required. A Health Certificate is not required for a student purchasing coverage for eligible dependents during the first 31 days of the student's first registered semester at UIC. A Health Certificate is not required when enrolling eligible dependents within 31 days of marriage, dependent's date of birth, adoption, placement under legal guardianship, or the initial arrival of a dependent into the United States from another country.

**Continuing Coverage for Nonregistered Terms:** Deadline to submit applications to UIHMO is the 31st day of the semester. Students enrolled in UIHMO/CampusCare the previous term may purchase continuing coverage for themselves and their dependents by submitting a completed Enrollment Application within the first 31 days of the semester coverage is requested. Students may purchase continuing coverage for up to three consecutive nonregistered semesters. An application must be submitted each term coverage is desired. The HMO fee will be assessed on the student's account.

A student who has completed the third consecutive semester of continuing coverage and remains ineligible for CampusCare coverage may convert into the UIHMO/AlumniCare Insurance Plan. Conversion coverage must be purchased within 31 days of the termination of the CampusCare insurance. Contact UIHMO Administration for additional information.

#### 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 SINC, 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.

#### 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 pro-rata refund of tuition and fees (excluding health service and HMO 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 instructions 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 student who withdraws from the University to enter military service must be on active duty within ten days after withdrawal in order for a refund of tuition and fees to be authorized. It is the student's responsibility to present proof of this active duty status. The most effective way of presenting such proof is to have the personnel officer of the unit to which the student is assigned certify to the University the date of assignment to active duty. Full credit is allowed for all courses in which the student has a grade of C or higher and a W, withdrawn without penalty, is recorded for courses in which the grade is below C.

***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.

## *College of Architecture and the Arts*

### School of Architecture

Bruno Ast, MArch, University of Illinois Urbana-Champaign  
Dana Buntrock, MArch

Stuart Cohen, MArch, Cornell University  
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 Urbana-Champaign

Douglas A. Garofalo, MArch, Yale University  
Michael S. Gelick, MArch, Massachusetts Institute of Technology

Sharon Haar, MArch, Princeton University  
Kenneth D. Isaacs, MFA, Cranbrook Academy of Art  
R. Thomas Jaeger, MArch, Massachusetts Institute of Technology

Phillip A. Kupritz, MArch, Massachusetts Institute of Technology

Sidney Robinson, ArchD, University of Michigan  
Lewis Rocah, MSc, Illinois Institute of Technology  
Katerina Ruedi, AA Diploma with Honors, The Architectural Association

Marilee Santos-Munne, MArch, Cornell University  
Kenneth A. Schroeder, MArch, University of Toronto  
Charles Waldheim, MArch

### School of Art and Design

William S. Becker, MFA, Cranbrook Academy of Art  
Wayne A. Boyer, MS, Illinois Institute of Technology  
Phyllis Bramson, MFA, School of the Art Institute of Chicago  
Drew R. Browning, MFA, School of the Art Institute of Chicago

Philip Burton, BFA, Philadelphia College of Art  
Rodney Carswell, MFA, University of Colorado

Julia Fish, MFA, The Maryland Institute  
John Greiner, BA, Philadelphia College of Art  
Olivia Gude, MFA, University of Chicago  
Klindt B. Houlberg, MA, Pennsylvania State University  
Martin R. Hurtig, MS, Illinois Institute of Technology

Marta Huszar, MFA, Yale University  
Douglas Ischar, MFA, California Institute of the Arts

Joseph Jachna, MS, Illinois Institute of Technology  
Judith Russi Kirshner, MA, Bryn Mawr  
Dennis A. Kowalski, MFA, School of the Art Institute of Chicago

Marcia Lausen, MFA, Yale University  
Jack Lemon, BFA, Kansas City Art Institute  
Silvia Malagrino, MFA, University of Illinois at Chicago  
Inigo Manglano-Ovalle, MFA, School of the Art Institute of Chicago

Kerry James Marshall, BFA, Otis Art Institute  
John Massey, BFA, University of Illinois Urbana-Champaign  
Gary L. Minnix, MFA, Temple University  
Esther Parada, MFA, Pratt Institute Art School; MS, Illinois Institute of Technology

Lawrence Salomon, BFA, University of Illinois Urbana-Champaign

Daniel J. Sandin, MS, University of Wisconsin, Madison  
Hans Schaal, MS, Institute of Design, Illinois Institute of Technology

Susan Sensemann, MFA, Temple University  
Anthony Tasset, MFA, School of the Art Institute of Chicago  
Guenther Tetz, MFA, University of Illinois Urbana-Champaign

Harriet S. Wadson, PhD, Union Graduate School  
Charles Wilson, MFA, Yale University  
Julie Zando, MFA, Bard College

### Department of Art History

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Robert Brueggemann, PhD, University of Pennsylvania  
Donald L. Ehresmann, PhD, New York University

Peter B. Hales, PhD, University of Texas, Austin  
Hannah B. Higgins, PhD, University of Chicago  
Victor Margolin, PhD, Union Graduate School  
Virginia E. Miller, PhD, University of Texas, Austin  
Robert Munman, PhD, Harvard University  
Martha Pollak, PhD, Massachusetts Institute of Technology  
David M. Sokol, PhD, New York University  
Woodman L. Taylor, PhD, University of Chicago

### Department of Performing Arts

Michael J. Anderson, DMA, University of Colorado  
Richard D. Billingham, DMA, American Conservatory of Music

Gene Collier, MM, Yale University  
Theodore Edel, DMA, Manhattan School of Music  
Anthony Graham-White, PhD, Stanford University

William Kaplan, DMA, University of Michigan  
David M. Powers, PhD, University of Chicago  
William Raffeld, MTA, Pasadena Playhouse College of Theatre Arts

Natalie Schmitt, PhD, Stanford University  
Richard A. Wang, MM, Chicago Musical College

## *College of Associated Health Professions*

### School of Biomedical and Health Information Sciences

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Alice A. Katz, PhD, University of Illinois at Chicago  
Donald Mon, PhD, Loyola  
Walter B. Panko, PhD, University of Missouri  
Russell Pearl, MD, University of Illinois  
Jonathan Silverstein, MD, Washington University School of Medicine

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  
David Braddock, PhD, University of Texas at Austin  
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 at Berkeley  
Tamar Heller, PhD, University of Illinois at Chicago  
Christopher Keys, PhD, University of Cincinnati  
Kenneth Swiatek, PhD, University of Illinois College of Medicine

### Department of Human Nutrition and Dietetics

Bahram Arjmandi, PhD, Kansas State University  
Charles Baum, MD, University of Chicago  
Phyllis E. Bowen, PhD, Cornell University  
Carol Braunschweig, PhD, University of Michigan

Irwin Brodsky, MD, Northwestern University  
Sujata Dixit, PhD, Tufts University  
Savitri K. Kamath, PhD, Iowa State University  
Shiriki K. Kumanyika, PhD

Robert Reynolds, PhD, University of Wisconsin-Madison  
Department of Occupational Therapy

David W. Beer, PhD, University of Chicago  
Joy M. Hammel, PhD, University of California at Berkeley and San Francisco State University

Gary W. Kielhofner, DrPH, University of California, Los Angeles

Craig A. Velozo, PhD, Ohio University  
School of Kinesiology

Robert J. Beck, PhD, University of Illinois Urbana-Champaign  
Daniel M. Corcos, PhD, University of Oregon



Karyn Esser, PhD, University of Nevada, Las Vegas  
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 James S. Horgan, PhD, University of Iowa  
 Sandra Levi, PhD, Northwestern University  
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 Warren K. Palmer, PhD, University of Iowa  
 Thomas P. Sattler, EdD, Oklahoma State University  
 Mohan Sapriv, PhD, National Institute of Mental Health and Neuroscience  
 Charles B. Walter, PhD, University of California, Los Angeles  
**Department of Physical Therapy**  
 Suzann K. Campbell, PhD, PT, University of Wisconsin, Madison  
 Ziaul Hasan, PhD, Massachusetts Institute of Technology  
 Hlapang Kolobe, PhD, Hahnemann University  
 Sandra B. Levine, PhD, PT, Loyola University of Chicago  
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 Jaeyoung Sung, PhD, Washington University  
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 Yair Moshe Babad, PhD, Cornell University  
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 Lloyd Graf Jr., PhD  
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 Chiayeng Wang, PhD  
**Department of Endodontics**  
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 Robert Scapino, PhD, University of Illinois  
 Dennis F. Weber, DDS, Marquette University  
 A. Moneim E. Zaki, PhD, University of Illinois  
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**Department of Oral and Maxillofacial Surgery**  
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 David S. Evaskus, DDS, University of Illinois  
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 Reza Mostofi, DMD, University of Tehran  
**Department of Orthodontics**



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 Cyril Sadowsky, MS, University of Illinois  
 Bernard Schneider, DDS, University of Illinois  
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 Raynard J. Dooley, EdD, Loyola University  
 Shahrbano Fadavi-Rudsari, DDS, University of Tehran  
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 Sabyasachi Mukherjee, Dr.Odont.  
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 Ales Obrez, PhD, University of Illinois at Chicago  
 Kevin J. Thorne, PhD, University of California, Los Angeles

### College of Education

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### College

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 Erick Smith, PhD, Cornell University  
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Constance M. Yowell, PhD, Stanford University

### College of Engineering

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 Earl E. Gose, PhD, University of California-Berkeley  
 Daniel Graupe, PhD, University of Liverpool, England  
 Bin He, PhD, Tokio Institute of Technology  
 Peter Hesketh, PhD, University of Pennsylvania.  
 Jens Karlsson, PhD, Massachusetts Institute of Technology  
 James Lin, PhD, University of Washington  
 Francis Loth, PhD, Georgia Institute of Technology  
 Richard Magin, PhD, University of Rochester.  
 Arif Masud, PhD, Stanford University  
 R. Natarajan, PhD, London University  
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#### Department of Chemical Engineering

Kenneth Brezinsky, PhD, City University of New York  
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 Sohail Murad, PhD, Cornell University  
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 Hector Reyes, PhD, University of Wisconsin, Madison  
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 Stephen Szepe, PhD, Illinois Institute of Technology  
 Christos Takoudis, PhD, University of Minnesota  
 Raffi M. Turian, PhD, University of Wisconsin, Madison  
**Department of Civil and Materials Engineering**  
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 David Boyce, PhD, University of Pennsylvania  
 Robert H. Bryant, PhD, Northwestern University  
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Richard Crago, PhD, Cornell University  
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 J. Ernesto Indacochea, PhD, Colorado School of Mines  
 Mohsen A. Issa, PhD, University of Texas  
 Arif Masud, PhD, Stanford University  
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 Krishna Reddy, PhD, Illinois Institute of Technology  
 Natacha Thomas, PhD, University of Illinois at Chicago  
 Thomas C. T. Ting, PhD, Brown University  
 Chien H. Wu, PhD, University of Minnesota

#### Department of Electrical Engineering and Computer Science

Gyan C. Agarwal, PhD, Purdue University  
 Rashid Ansari, PhD, Princeton University  
 Davorin Babic, PhD, University of Pennsylvania  
 Jezekiel Ben-Arie, DrSc, Israel Institute of Technology  
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 Wolfgang-Martin Boerner, PhD, University of Pennsylvania  
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 Bin He, PhD, Toyko Institute of Technology  
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 Roland Priemer, PhD, Illinois Institute of Technology  
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 Robert H. Sloan, PhD, Massachusetts Institute of Technology  
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 Science, New York University  
 Boaz J. Super, PhD, University of Texas at Austin  
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 Korada Umashankar, PhD, University of Mississippi  
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 Alexander Weidenbaum, PhD, University of Illinois Urbana-  
 Champaign  
 Ouri Wolfson, PhD, Columbia University  
 Hung-Yu Yang, PhD, University of California, Los Angeles  
 Clement T. Yu, PhD, Cornell University  
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 Suresh K. Aggarwal, PhD, Georgia Institute of Technology  
 Farid M. L. Amirouche, PhD, University of Cincinnati  
 Prashant Banerjee, PhD, Purdue University  
 James G. Boyd, PhD, Texas A&M University  
 Sabri Cetinkunt, PhD, Georgia Institute of Technology  
 Soyoung Cha, PhD, University of Michigan  
 Mun Y. Choi, PhD, Princeton University  
 Brian Collier, PhD, Cornell University  
 David M. France, PhD, University of California, Berkeley  
 Alexander A. Fridman, PhD, Moscow Physical Technical  
 Institute  
 Yuri Gogotsi, DSc, Ukrainian Academy of Science  
 Selcuk I. Guceri, PhD, North Carolina State University  
 Krishna C. Gupta, PhD, Stanford University  
 James P. Hartnett, PhD, University of California, Berkeley  
 Jens Karlsson, PhD, MIT  
 Lawrence A. Kennedy, PhD, Northwestern University  
 Kyuil Kim, PhD, University of Wisconsin, Madison  
 Faydor L. Litvin, Dr. Tech. Sci., Leningrad Polytechnic  
 Institute  
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 Constantine M. Megaridis, PhD, Brown University  
 Floyd G. Miller, PhD, University of Illinois Urbana-  
 Champaign  
 Wolodymyr J. Minkowycz, PhD, University of Minnesota  
 Bradley J. Nelson, PhD, Carnegie Mellon University  
 Ishwar K. Puri, PhD, University of California, San Diego  
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Women's Studies Program  
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Reed G. Williams, PhD, Indiana University  
Annete M. Yonke, PhD, University of Chicago  
Department of Microbiology and Immunology  
Burton Andersen, MD, University of Illinois  
Truman O. Anderson, PhD, University of Illinois  
Clara G. Bell, PhD, Hebrew University  
Ananda M. Chakrabarty, PhD, University of Calcutta  
Edward P. Cohen, MD, Washington University  
Dario Giacomoni, PhD, University of Illinois  
W.C. Hanly, PhD, Rice University  
Riaz U. Haque, PhD, Ohio State University  
William G. Hendrickson, PhD, Tufts Medical School  
Amy Kenter, PhD, Albert Einstein College  
Newton Khoobyarian, PhD, University of Wisconsin  
Philip Matsumura, PhD, University of Rochester  
Tapan K. Misra, PhD, Calcutta University  
Harvard Reiter, PhD, George Washington University  
Simon Silver  
Marius Teodorescu, PhD, School of Medicine, Romania  
David S. Ucker, PhD  
Karl W. Volz, PhD, University of California, San Diego  
William E. Walden, PhD, Morgan State University  
Department of Molecular Genetics  
Richard L. Davidson, PhD, Western Reserve University  
Louis P. Deiss, PhD, University of Chicago  
Andrei V. Gudkov, PhD, Moscow State University  
Nissim Hay, PhD, Weizmann Institute of Science, Rehovot  
Alisa L. Katzen, PhD, University of California  
Elliot Kaufman, PhD, Princeton University  
Lester F. Lau, PhD, Cornell University  
Sergei M. Mirkin, PhD, Institute of Molecular Genetics, Moscow  
Peter Moore, PhD, National Institute of Medical Research Mill Hill, London  
Igor B. Roninson, PhD, Massachusetts Institute of Technology  
Kiranur N. Subramanian, PhD, Indian Institute of Science, Bangalore  
Angela L. Tyner, PhD, University of Chicago  
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Department of Ophthalmology  
Kenneth R. Alexander, PhD, University of Washington  
Muayyad Al-Ubaidi, PhD, Baylor College of Medicine  
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Department of Pathology  
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 Xiaoping Du, MD, PhD, Sydney University  
 Ervin Erdoes, MD, University of Munich  
 Stefano Fiore, MD, University of L'Aquila Medical School  
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 Zhiyuan Shen, MD, PhD, Colorado State University  
 Randal A. Skidgel, PhD, University of California, San Diego  
 Chinnaswamy Tirupathi, PhD, University of Madras  
 Duane L. Venton, PhD, University of Michigan, Ann Arbor  
 Tatyana Voyno-Yasenetskaya, MD, PhD, Institute of Pathology and Physiology, Moscow, Russia  
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**Department of Physiology and Biophysics**  
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 Sarah B. Appel, PhD, University of Illinois at Chicago  
 Jose A.L. Arruda, MD, Universidade Federal Fluminense Medical School  
 Kate Barany, PhD, Goethe University  
 H. Bruce Bosmann, PhD, University of Rochester School of Medicine and Dentistry  
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 Yun L. Chan, PhD, University of Louisville  
 George Crystal, PhD, Rutgers University  
 Brian Curtis, PhD, Rockefeller University  
 Primal DeLanerolle, PhD, University of California, San Diego  
 Claude Desjardins, PhD  
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 Asgerally T. Fazleabas, PhD, University of Illinois  
 James L. Ferguson, PhD, Purdue University  
 Daniel Fiat, DSc, Israel Institute of Technology  
 Jesús García Martínez, MD, PhD, Centro de Investigación y Estudios Avanzados del IPN  
 Guela Gibori, PhD, Tel Aviv University  
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 Robert F. Loizzi, PhD, Iowa State University  
 Anne F. Martin, PhD, University of Cambridge  
 Marvin McMillen, MD, State University of New York, Buffalo  
 Josephine Miller, PhD  
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 David Pepperberg, PhD, Massachusetts Institute of Technology  
 Sergey Popov, PhD, Moscow State University  
 Gail S. Prins, PhD  
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 Krishnamurthy Ramaswamy, PhD  
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 Israel Rubinstein, MD, Hebrew University Hadassah School of Medicine  
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 Terry G. Untherman, MD  
 Laird Wilson, PhD, West Virginia University  
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 Michael J. Blend, PhD, Cornell University  
 Dan G. Pavel, MD, Faculty of Medicine, Bucharest  
**Department of Surgery**  
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 (South Africa)  
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 Department of Surgical Oncology  
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 John A. Greager, MD, University of Illinois

### *College of Nursing*

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 Kathleen Baldwin, PhD, University of Illinois at Chicago  
 Bonnie Breitmayer, PhD, Cornell University  
 Gloria Bonner, University of Illinois at Chicago  
 MaryBeth Buschmann, PhD, University of Illinois at Chicago  
 Shu-Pi Chen, DrPH, University of California, Los Angeles  
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 Wendy Nehring, PhD, University of Illinois at Chicago  
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 Minu Patel, MSN, Aberdeen University (United Kingdom)  
 Nilda Peragallo, DrPH, University of Texas at Houston  
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 Eva Smith, PhD, Kansas State University, Manhattan  
 Judith Storfjell, PhD, University of Michigan  
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 Sandra Theis, PhD, Northwestern University  
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 Jacqueline Walcott-McQuigg, PhD, University of Illinois at Chicago  
 Rosemary White-Traut, DNSc, Rush University  
 JoEllen Wilbur, PhD, University of Illinois at Chicago  
 Wendy B. Young, PhD, University of Illinois at Chicago  
 Julie Zerwic, PhD, University of Minnesota

### *College of Pharmacy*

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 Judy Bolton, PhD, University of Toronto  
 Karol Bruzik, PhD, Polish Academy of Science  
 Geoffrey A. Cordell, PhD, University of Manchester  
 William J. Dunn, PhD, Oklahoma State University  
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 Matthias Lu, PhD, Ohio State University  
 Alexander Mankin, PhD, Moscow State University  
 Alexander A. Neyfakh, PhD, Moscow State University  
 John M. Pezzuto, PhD, University of Medicine and Dentistry of New Jersey  
 Djaja D. Soejarto, PhD, Harvard University  
 Steven Swanson, PhD, University of Illinois at Chicago  
 Richard Van Breeman, PhD, Johns Hopkins University  
 Duane L. Venton, PhD, University of Michigan  
 Donald P. Waller, PhD, Ohio State University  
 Charles P. Woodbury, PhD, University of Wisconsin, Madison  
 Department of Pharmaceutics and Pharmacodynamics

Hayat M. Alkan-Onyuksel, PhD, University of London  
 Win L. Chiou, PhD, University of California, San Francisco  
 Erick Dadey, PhD, University of Kentucky  
 James Fischer, PharmD, University of Minnesota  
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 Michael J. Groves, PhD, University of Loughborough  
 Robert E. Guensslen, PhD, Cornell University  
 Anil Gulati, MD, King George's Medical College  
 Helen Kastrissio, PhD, University of Queensland  
 Norman L. Katz, PhD, Albany Medical College of Union University  
 Ronald L. Koch, PhD, University of Illinois at Chicago  
 Ah-Ng Tony Kong, PhD, SUNY at Buffalo  
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 Adam Negrusz, PhD, Nicolos Copernicus Medical Academy  
 Nicholas P. Plotnikoff, PhD, University of Texas, Galveston  
 Keith A. Rodvold, PharmD, University of Minnesota  
 R. Francis Schlemmer, PhD, University of Illinois at Chicago  
 Donald P. Waller, PhD, Ohio State University  
 Eugene F. Woods, PhD, Medical University of South Carolina  
 Department of Pharmacy Administration  
 Stephanie Y. Crawford, PhD, University of Texas-Austin  
 Paul G. Grussing, PhD, University of Minnesota  
 Bruce Lambert, PhD, University of Illinois Urbana-Champaign  
 J. Warren Salmon, PhD, Cornell University  
 Surrey Walton, PhD, University of Chicago

#### **Department of Pharmacy Practice**

Larry Danziger, PharmD, University of Cincinnati  
 James H. Fischer, PharmD, University of Minnesota  
 Richard A. Hutchinson, PharmD, University of Michigan  
 Alan H. M. Lau, PharmD, State University of New York, Buffalo  
 Keith A. Rodvold, PharmD, University of Minnesota

### *School of Public Health*

Gary L. Albrecht, PhD, Emory University  
 Shaffdeen A. Amuwo, PhD, University of Illinois at Chicago;  
 Columbia Pacific University  
 Robert J. Anderson, PhD, University of Michigan  
 Lyndon R. Babcock, PhD, University of Washington  
 Robert C. Bailey, PhD, Harvard University  
 Bernard H. Baum, PhD, University of Chicago  
 Joseph Begando, PhD, University of Illinois at Urbana  
 Badi M. Boulous, PhD, University of Missouri  
 David Braddock, PhD, University of Texas at Austin  
 Gary R. Brennum, PhD, University of Michigan

Jacob A. Brody, MD, State University of New York  
 Dee Burton, PhD, New School for Social Science  
 Michael Cailas, PhD, McGill University  
 Noel Chavez, PhD, St. Louis University  
 Edwin H. Chen, PhD, University of California Los Angeles  
 Tom H. Christoffel, JD, Harvard University Law School  
 Milton J. Clark, PhD, University of Kansas  
 Kendon J. Conrad, PhD, University of Illinois at Chicago  
 Lorraine M. Conroy, ScD, Harvard University  
 Judith Cooksey, MD, MPH, University of Illinois-School of Medicine  
 Kevin G. Croke, PhD, Northwestern University  
 Faith G. Davis, PhD, Yale University  
 Samuel S. Epstein, MD, London University  
 Brian R. Flay, PhD, Waikato University (New Zealand)  
 Phillip Forman, MD, Ohio State University  
 John E. Franke, PhD, University of Illinois at Chicago  
 Sally Freels, PhD, Northwestern University  
 Sylvia E. Furner, PhD, University of Illinois at Chicago  
 Jack H. Goldberg, PhD, University of Illinois at Chicago  
 Paul J. Goldstein, PhD, Case Western Reserve University  
 Audrey Gordon, PhD, University of Illinois at Chicago  
 William R. Hall, DDS, MPH, West Virginia University  
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 Rebecca Hendrick, PhD, Michigan State University  
 Timothy Johnson, PhD, University of Kentucky-Lexington  
 James Thompson, PhD, Syracuse University  
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 Charles J. Hoch, PhD, University of California Los Angeles  
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 Curtis R. Winkle, PhD, Rutgers University  
 Ting-Wei Zhang, PhD, University of Illinois at Chicago  
*Institute on Disability & 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

Tamar Heller, PhD, University of Illinois at Chicago

Christopher Keys, PhD, University of Cincinnati

Kenneth Swiateck, PhD, University of Illinois

### *Research Resources Center*

Gordon L. Humphrey, PhD, University of California Los Angeles

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

## Architecture

*Mailing Address: School of Architecture, 845 W. Harrison, M/C 030, Chicago, IL 60607-7024*  
*Campus Location: 3100 A&A*  
*Curriculum Code: 0524*  
*Telephone: (312) 996-3335*  
*Email: noreen@uic.edu*

*Director, School of Architecture: Katerina Ruedi*  
*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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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 coursework. Applicants to the three year option are required to submit a portfolio of current creative work that 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.

### Coursework

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 or Project

*Independent Projects:* Requires the permission of the Curriculum Committee. No more than 6 hours of Arch 598 can be applied to the degree.

## Art History

*Mailing Address: Department of Art History, 935 W. Harrison, M/C 201, Chicago, IL 60607-7039*

*Campus Location: 310 HH*

*Curriculum Code: 0924*

*Telephone: (312) 996-3303*

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

*Chairperson, Department of Art History: David Sokol*

*Director of Graduate Studies: Robert Munman*

The Art History Department offers work leading to the Master of Arts in Art History. Study and research is available in the general areas of the history of architecture and art.

### 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 650.

*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

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:* 40.

### Coursework

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 or Project**

Thesis optional. No more than 8 hours of AH 598 can be applied to the degree. Students who do not write a thesis must submit two substantial research papers written in conjunction with graduate courses taken in the Art History Department to the departmental Graduate Program Committee. No additional credit is granted for the completion of these papers.

### **Art Therapy**

*Mailing Address: School of Art and Design, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 0724*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

*Coordinator of Art Therapy Program: Harriet Wadson*

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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

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

**Minimum TOEFL Score:** 580.

**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.

### **Degree Requirements**

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

**Minimum Semester Hours Required:** 62.

### **Coursework**

**Required Courses:** AD 550, 551, 552, 555, 556, 557, 558, 581, 582, 583, 598; 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 or Project**

Thesis required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1124*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

The School of Art & 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 580.

**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) or 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.

#### **Coursework**

**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 or Project**

Project required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1724*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

The School of Art & 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 580.

**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 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.

#### **Coursework**

**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 or Project**

Project required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1224*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

The School of Art & 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 580.

**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 Quark XPress, 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.

#### **Coursework**

**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 or Project**

Project required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038

**Campus Location:** 106 JH

**Curriculum Code:** 1324

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

**Email:** bosbo@uic.edu

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

**Director of Graduate Studies:** Klindt Houlberg

The School of Art & 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**

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 580.

**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.

#### **Coursework**

**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 or Project**

Project required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1524*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

The School of Art & 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580.

*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.

### Coursework

*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 or Project

Project required. 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, 929 W. Harrison, M/C 036, Chicago, IL 60607-7038*

*Campus Location: 106 JH*

*Curriculum Code: 1924*

*Telephone: (312) 996-3337*

*Email: bosbo@uic.edu*

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

*Director of Graduate Studies: Klindt Houlberg*

The School of Art & 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 580.

*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.

#### **Coursework**

**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 or Project**

Project required. 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.

### **Theatre**

**Mailing Address:** Department of Performing Arts, 1040 W. Harrison, M/C 255, Chicago, IL 60607-7130

**Campus Location:** L018 ECSW

**Curriculum Code:** 5124

**Telephone:** (312) 996-2977

**Email:** anthony.graham-white@uic.edu

**Chairperson, Department of Performing Arts:** Luigi Salerni

**Director of Graduate Studies:** Anthony Graham-White

The Department of Performing Arts offers work leading to the Master of Arts in Theatre. An interdepartmental concentration in women's studies is 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 also meet the following program requirements:

**Baccalaureate Field:** No restrictions. Applicants must have the equivalent of 20 semester hours of study in theatre or a relevant field.

**Grade Point Average:** At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Letters of Recommendation:** Three required, at least two of which must be of an academic nature.

**Personal Statement:** Required; 600 words; the statements should address the way in which graduate study in the department relates to the applicant's career or other aims.

#### **Nondegree Applicants**

Nondegree applicants will not be accepted.

### **Degree Requirements**

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

**Minimum Semester Hours Required:** 32.

#### **Coursework**

At least 20 hours must be at the 500 level. Students who receive more than one grade below B in their graduate coursework, or four Incompletes that have not been made up within the regulatory one term, will be dropped from the program.

**Required Courses:** Thtr 502, and one of Thtr 521, 522, or 523.

**Electives:** No more than 8 hours can be taken in other departments and no more than 6 hours can be taken in independent studies.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Required. Thesis students must earn 8 hours in Thtr 598. The project option consists of a theatre production and a written account of it. Students electing the project option must earn 8 hours in Thtr 597.

#### **Interdepartmental Concentration in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Biomedical Visualization

*Mailing Address: School of Biomedical and Health Information Sciences, Biomedical Visualization, Office of Graduate Studies, 1919 W. Taylor, M/C 527, Chicago, IL 60612-7249*

*Campus Location: 211 AHP*

*Curriculum Code: 5348*

*Telephone: (312) 996-6317*

*Email: gradbhi@uic.edu*

*Head of the Division: Lewis Sadler*

*Director of Graduate Studies: Alice Katz*

The school offers a two-year graduate program leading to the Master of Associated Medical Sciences (MAMS) degree in Biomedical Visualization. Coursework and research are available in 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. The school also offers a program leading to a degree in Medical Laboratory Sciences; consult the appropriate chapter in this catalog for more information.

### Admission Requirements

Up to twelve applicants per year will be accepted. 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). Coursework in sculpture is recommended for applicants interested in prosthetics/3-D model design; coursework in computer graphics is recommended for applicants interested in computer visualization; and coursework in painting and illustration is recommended for applicants interested in illustration and design.

**Grade Point Average:** At least 4.00 on a 5.00 scale (3.00 on a 4.00 scale).

**Tests Required:** GRE general. Applicants must have a combined score of 1000 on the verbal and quantitative portions of the GRE general.

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Three required from instructors or employers.

**Personal Statement:** Required; contact the program for guidelines.

**Other Requirements:** A personal interview and portfolio review with the departmental faculty are required. The portfolio must include twenty slides of representational images in any media, and must include examples from the figure. 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:** 45—47.

### Coursework

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

**Electives:** 10 hours from among Anat 414; AHS 510; BVis 515, 520, 525, 530, 540, 542, 545, 550, 555, 580, 594, 596.

### Comprehensive Examination

None.

### Thesis or Project

Required. Students who complete a project must earn at least 5 hours in BVis 597; thesis students must earn at least 7 hours in BVis 598.

## Disability and Human Development

*Mailing Address: Department of Disability and Human Development, 1640 W. Roosevelt Road, M/C 626. Chicago, IL 60608-6904*

*Campus Location: 436 IIDD*

*Curriculum code: 8048*

*Telephone: (312) 413-1647*

*Email: DHD@uic.edu*

*Head of the Department: David Braddock*

*Director of Graduate Studies: Tamar Heller*

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 policy and organization, disability studies, 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.

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

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 4.00 (A=5.00) 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.

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

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

**Deadlines:** Although applications for admission are accepted at any time, to receive full consideration for Fall admission, including consideration for graduate assistantships, application 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.

#### **Coursework**

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:**

Rehabilitation Technology: DHD 440 and DHD 565.

Disability Policy and Organization: Must complete an additional six hours of course work consisting of DHD 430 and one additional course from among the following: DIS 420, DIS 525, DIS 530, or DIS 535.

Disability Studies: Must complete the following two additional courses: DHD 570 and DHD 575.

#### **Comprehensive Examination**

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

#### **Thesis or Project**

Students must complete either a thesis or a project. 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 must complete at least 8 hours of DHD 598. Non-thesis students must complete at least 4 hours of DHD 597.

## **Disability Studies**

**Mailing Address:** College of Associated Health Professions Office of the Dean, 808 S. Wood St., M/C 518, Chicago, IL 60612-7305

**Campus Location:** 169 CMET

**Curriculum code:** 1048

**Telephone:** 996-6695

**Email:** kielhofnr@uic.edu

**Director of Graduate Studies:** Gary Kielhofner

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 Ph.D. program will arrange such meetings for applicants upon request. (see phone number above)

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

**Baccalaureate field:** Bachelors or Masters degree in an area relevant to the program.

**Grade Point Average:** At least 4.0 (A=5.0) for the final 60 semester hours (90 quarter hours) of undergraduate study and a minimum of 4.0 (A=5.0) 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.

**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.

#### **Coursework**

**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 adviser.

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

#### **Examinations**

**Qualifying Examination:** Required, written.

**Preliminary Examination:** Required.

**Dissertation:** 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 scientific community.

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

## **Human Nutrition and Dietetics**

**Mailing Address:** Department of Human Nutrition and Dietetics, 1919 W. Taylor, M/C 517, Chicago, IL 60612-7256

**Campus Location:** 650 AHP

**Curriculum Code:** 2148

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

**Email:** nutrition@uic.edu

**Head of the Department:** Shiriki Kumanyika

**Director of Graduate Studies:** Shiriki Kumanyika

The Department of Human Nutrition and Dietetics 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 Ph.D.) 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 coursework 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 coursework. Minimum prerequisites for full admission to graduate study in nutrition can be obtained from the department.

In most circumstances, direct admission to the Ph.D. program in nutrition will be reserved for applicants with a prior master's degree in a related field. Applicants without a prior M.S. degree will be admitted to the Ph.D. program through an M.S./Ph.D. route.

**Grade Point Average:** At least 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

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

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Three required.

**Personal Statement:** Required.

**Other requirements:** Candidates for direct admission to Ph.D. 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 Ph.D. candidates, are welcomed at any time. All applicants for direct admission for Ph.D. 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.

#### **Coursework**

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

**Electives:** Students must take at least two courses from among HND 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 or Project**

Thesis required. Students must earn at least 7 hours in HND 598.

**Doctor of Philosophy**

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

#### **Coursework**

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

**Electives:** Choice of electives should be guided by the sub-

area of interest, in consultation with advisors.

#### **Examinations**

**Preliminary Examination:** Required. Through written and oral qualifying examinations, all Ph.D. 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 HND 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, 901 W. Roosevelt Road, M/C 194, Chicago, IL 60608-1516

**Campus Location:** 354 PEB

**Curriculum Code:** 2948

**Telephone:** (312) 996-4810

**Email:** tstone@uic.edu

**Head of the School:** Lawrence Oscai

**Director of Graduate Studies:** Warren K. Palmer

The School of Kinesiology offers work leading to degrees in Kinesiology at both the master's and doctoral levels. Coursework and research leading to a graduate degree in exercise science, kinesiology studies, motor control and learning, physical education and sport management, and sport injury management at the M.S. level and exercise molecular biology and exercise neuroscience at the Ph.D. level.

#### **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. Prior work in areas of kinesiology may be required.

**Grade Point Average:** At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study and for all graduate work.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

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

**Personal Statement:** Required.

**Doctor of Philosophy**

**Prior Degrees:** No restrictions; however, at least one year of undergraduate coursework in physics, organic chemistry, calculus, and biology are required for exercise molecular biology. For admission to exercise neuroscience, students must have completed one year of physics and calculus.

**Grade Point Average:** At least 4.0 (A=5.0) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 4.5 (A=5.0) 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.

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

**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:** Varies by option. Coursework only—40; all other options—32.

### Coursework

Four options are available to students in this program: coursework only; thesis; project; or examination/internship. Students must have the permission of the Kinesiology Graduate Studies Committee to pursue the thesis, project, or examination/internship options. Students in the coursework-only option must take at least 18 hours at the 500 level. Students in the other options must take at least 12 hours at the 500 level. 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.

**Required Courses:** Kine 590. Students in the coursework-only option must also take Kine 589. Students in the other options must also take Kine 595. All students must take at least 9 hours in their specialization.

**Electives:** Students in the coursework-only option must take at least 12 hours in kinesiology courses, plus at least 6 hours in cognate courses in other departments. Students in the other options must take at least 9 hours in kinesiology courses plus at least 5 hours in cognate courses in other departments.

### Comprehensive Examination

Required only for students in the examination/internship option. Students in the examination/internship option must earn 3 hours in Kine 593.

### Thesis or Project

Optional. Thesis students must earn at least 5 hours in Kine 598. Students pursuing the project option must earn at least 3 hours in Kine 597.

## Doctor of Philosophy

**Minimum Semester Hours Required:** 96.

### Coursework

**Required Courses:** Kine 521, 522, 551, 590, 599, and 523, 528, 529 for the exercise molecular biology specialization, and 570, 571, 572, 573 for the exercise neuroscience specialization.

**Electives:** Students in the exercise molecular 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 exercise neuroscience specialization must take a minimum of 4 semester hours of elective course work in areas determined in consultation with their research advisor.

### Examinations

**Preliminary Examination:** Required; a written preliminary examination followed by an oral preliminary examination.

**Dissertation:** Required; two seminars and a final defense of the dissertation are required.

**Other Requirements:** All Ph.D. students must participate in the teaching programs of the School of Kinesiology.

## Medical Laboratory Sciences

**Mailing Address:** School of Biomedical and Health Information Sciences, Medical Laboratory Sciences, Office of Graduate Studies, 1919 W. Taylor, M/C 520, Chicago, IL 60612-7249

**Campus Location:** 690 CME

**Curriculum Code:** 9848

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

**Email:** gradbhi@uic.edu

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

Medical Laboratory Sciences offers work leading to a Master of Science in Medical Laboratory Sciences. Course work and research is available in the areas of biomedical science, discipline specialties, clinical laboratory management

and health informatics.

### Admission Requirements

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

**Baccalaureate Field:** Medical technology, clinical laboratory science, or a life science degree acceptable to the division.

**Grade Point Average:** At least 4.00 (A=5.00).

**Tests Required:** GRE general; minimum score 1100.

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Not required.

**Personal Statement:** Included in the interview

process. **Other Requirements:** Applicants must possess current certification by a recognized clinical laboratory science certification agency or be eligible for certification or have at least one year of full-time experience in an area of medical laboratory sciences such as clinical chemistry, clinical microbiology, hematology, or immunochemistry. They must have an interview with and be recommended by a member of the graduate faculty of the department.

### Degree Requirements

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

**Minimum Semester Hours Required:** 36.

### Coursework

**Required Courses:** AHS 510; Bstt 400; 3 hours each of MLS 570 and 595.

### Comprehensive Examination

None.

### Thesis or Project

Thesis required. Students must earn at least 7 hours in MLS 598.

### Other Requirements

Experience in teaching undergraduate medical technology students is required and is usually completed in the area of the student's major.

## Occupational Therapy

**Mailing Address:** Department of Occupational Therapy, 1919 W. Taylor, M/C 811, Chicago, IL 60612-7250

**Campus Location:** 311 AHP

**Curriculum Code:** 5448

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

**Email:** shari.gilbert@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 Master of Science degree for students who desire an advanced degree as well as for students who have a bachelor's degree in another subject and who want to obtain credentials to practice occupational therapy while completing their master's degree. 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 (on 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

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 a Baccalaureate degree in Occupational Therapy or a Baccalaureate degree in any other field plus having completed the following prerequisites with a grade of C or above prior to enrollment: one course in anthropology or sociology (equivalent of Anth 101 or Soc 100); two courses in psychology [child psychology or child development\* (equivalent of Psch 320) and abnormal psychology\* (equivalent of Psch 270)]; one course in methods of inquiry (e.g., research methods, statistics, research design, symbolic logic, philosophy of science); 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 of Kine 251 and 252)].

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

**Grade Point Average:** At least 4.00 (A=5.00) calculated on the last 60 semester (90 quarter) hours toward the first bachelor's degree and subsequent coursework.

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

**Minimum TOEFL Score:** 550.

**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:** 36.

#### **Coursework**

**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. At least one course must be taken in the department.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Thesis or project required. Thesis students must earn at least 8 hours in OT 598. 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.

## **Physical Therapy**

**Mailing Address:** Department of Physical Therapy, 1919 W. Taylor, M/C 898, Chicago, IL 60612-7251

**Campus Location:** 448 AHP

**Curriculum Code:** 9648

**Telephone:** (312) 996-1502

**Head of the Department:** Jules Rothstein

**Director of Graduate Studies:** Suzann Campbell

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.

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 4.00 (A=5.00).

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

**Minimum TOEFL Score:** 550. In addition to the TOEFL, foreign applicants must also pass the Test of Spoken English (TSE) with a score of at least 230.

**Letters of Recommendation:** Two 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) and two years of clinical experience. Preference will be given to applicants with at least one year of specialty practice (musculoskeletal or neurologic, adult or pediatric).

### **Degree Requirements**

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

**Minimum Semester Hours Required:** 36.

#### **Coursework**

At least 11 hours must be at the 500 level, of which at least 6 must be in didactic courses. At least 16 hours must be in physical therapy. Students receiving 3 or more grades of C will be dismissed from the program.

**Required Courses:** AHS 510; Bstt 500 or Soc 401 or the equivalent; PT 519, 461, 462, 463, and 595.

**Electives:** Students must choose one of the following options:

Musculoskeletal—PT 520, 521, and 522.

Neurology—Three from among PT 502, 503, 510 or 511.

#### **Comprehensive Examination**

Required; written.

#### **Thesis or Project**

Thesis required. 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 Business Administration

## Accounting

*Mailing Address: Department of Accounting, 601 S. Morgan, M/C 075, Chicago, IL 60607-7122*

*Campus Location: 2331 UH*

*Curriculum Code: 0317*

*Telephone: (312) 996-4751*

*Email: agrosi@uic.edu*

*Head of the Department of Accounting: Ronald Picur*

*Director of Graduate Studies: Ahmed Riahi-Belkaoui*

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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study. Applicants possessing a master's degree in business or 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 4.00 (A=5.00) in that program.

*Tests Required:* GMAT.

*Minimum TOEFL Score:* 570.

*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.

## Coursework

Degree candidates must present a cumulative grade point average of at least 4.00 (A=5.00) 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. 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 non-business courses offered by colleges other than the College of Business Administration.

## Comprehensive Examination

None.

## Thesis or Project

None.

MBA/MS (Accounting)

**Minimum Semester Hours Required:** 68.

## Coursework

Students must maintain a cumulative grade point average of at least 4.00 (A=5.00) for all course work, including background courses.

*Required Courses:* For full-time students—MBA 501, 502, 503, 504, 505, 506, 507, 508, 509, 590 (two sections year one and two sections year two), 510 and 594 (two sections); two advanced business electives; Actg 515 and 593; Actg 465, 484, 515, 525, 535, or 545; two accounting/business electives; one business elective; one business/nonbusiness elective; and one nonbusiness elective. Students with degrees in fields other than accounting must also take Actg 335, 474, 500, 502, 503, 506, 508, and IDS 531. Students are exempt from those requirements for which satisfactory equivalent study has been completed.

For part-time students—Econ 520 and 521; Fin 500; IDS 531 and 532; Mgmt 541 and 590; Mktg 500; two business electives; Actg 515 and 593; Actg 465, 484, 516, 525, 535, or 545; two accounting/business electives; one business elective; one business/nonbusiness elective; and one nonbusiness elective.

## Comprehensive Examination

None.

## Thesis or Project

None.

## Business Administration PhD

*Mailing Address: Business Doctoral Studies, 601 S.*

*Morgan, M/C 075, Chicago, IL 60607-7122*

*Campus Location: 2331 UH*

*Curriculum Codes: 1317 (Economics), 1917 (Finance), 2817 (HRM), 3217 (Marketing), 4417 (MIS)*

*Telephone: (312) 996-4751*

*Email: agrosi@uic.edu*

*Director of PhD Program: Peter Chalos*

Programs leading to a doctoral degree are available in five areas of business: business economics, finance, human resource management, management information systems, and marketing.

The College of Business Administration is accredited by the American Assembly of Collegiate Schools of Business. Programs leading to the Master of Science in Accounting, the Master of Arts in Economics, and the Master of Science in Management Information Systems are also available; consult the appropriate chapter(s) in this catalog for more information.

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 information on the MBA program.

## Admission Requirements

In addition to the Graduate College minimum requirements, applicants must meet the following program 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 3.75 (A=5.00) 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.

**Minimum TOEFL Score:** 600.

**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:** 112 from the baccalaureate, 80 from the MBA.

### Coursework

Students entering the program without prior, recent graduate-level work in mathematics/statistics, computing/analysis, and/or business must take the MBA core courses; specific areas are likely to require additional prerequisites.

**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

**Departmental Qualifying Examination:** Required.

**Preliminary Examination:** Required; written and oral.

### Dissertation

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, 601 S. Morgan. M/C 144, Chicago, IL 60607-7121

**Campus Location:** 2103 UH

**Curriculum Codes:** 1417 (MA), 3126EC (PPA PhD)

**Telephone:** (312) 996-2683

**Email:** pjpiper@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 Public Policy Analysis with a specialization 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** GRE or GMAT.

**Minimum TOEFL Score:** 550.

**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.

### Coursework

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 520, 521, 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 4.00. Credit will be given for at most one grade of C in any of these courses.

### Comprehensive Examination

None.

### Thesis or Project

Thesis optional. No more than 8 hours of Econ 598 can be applied to the degree. 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.

**Coursework**

No more than 12 hours total of Econ 592, 596, 597, and 598 can be applied to the degree.

**Required Courses:** Econ 501, 502, 511, 512, 534, and 535. Full-time students must also take MBA 501, 502, 503, 504, 505, 506, 507, 508, or 509, and MBA 590 or MBA 510 and 594. Part-time students must also take Actg 500, Fin 500, IDS 531 and 532, Mgmt 541 and 590, 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 4.00. 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, and 541), and 8 additional hours in MBA electives outside of economics.

**Comprehensive Examination**

None.

**Thesis or Project**

Thesis optional. No more than 8 hours of Econ 598 can be applied to the degree. 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 in Public Policy Analysis

**Minimum Semester Hours Required:** 104 from the baccalaureate, 72 from the master's.

**Coursework**

**Required Courses:** Econ 501, 502, 511, 512, 534, 535, and 592; and PPA 500, 541, and 590.

Students must also select two areas, each consisting of at least two 500-level Economics courses. The required courses and Econ 520, 521, 540, 541, 592, 593, 596, 598, or 599 may not be used to satisfy the area requirement.

**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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Management Information Systems

**Mailing Address:** Department of Information and Decision Sciences, 601 S. Morgan, M/C 075, Chicago, IL 60607-7122

**Campus Location:** 2331 UH

**Curriculum Code:** 4817

**Telephone:** (312) 996-4751

**Email:** [agrosi@uic.edu](mailto:agrosi@uic.edu)

**Head of the Department:** Robert Abrams

**Director of Graduate Studies:** King-Tim Mak

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 Business Administration doctoral program also offers a specialization in Management Information Systems; 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:** 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 coursework: 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), and database management systems (e.g., IDS 410 or 510); and at least one course in oral and written communications (e.g., BA 200, Comm 214 or 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 4.00 (A=5.00) 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 4.00 (A=5.00) in that program.

**Tests Required:** GMAT or GRE taken within five years of entry into the program. Minimum GMAT: 500.

**Minimum TOEFL Score:** 570.

**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.

### Degree Requirements

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

**Minimum Semester Hours Required:** 32.

**Coursework**

**Required Courses:** IDS 401, 507, 514, and 520.

**Electives:** Chosen with an advisor. Courses must be taken from a list of graduate courses approved by the director. Courses used to satisfy admission requirements (e.g., IDS 405 or 510) cannot be counted toward degree requirements.

**Comprehensive Examination**

None.

**Thesis or Project**

None.

## Oral Sciences

*Mailing Address:* College of Dentistry, 801 S. Paulina, M/C 621, Chicago, IL 60612-7211

*Campus Location:* 102 Dent

*Curriculum Code:* 5019

*Telephone:* (312) 996-0213

*Email:* eisenman@uic.edu

*Director of Graduate Studies:* Dale R. Eisenmann

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. Students have a variety of opportunities for specialization within the program according to their interests and their chosen careers in dentistry.

### 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 coursework should include biology, general chemistry and other related sciences.

*Grade Point Average:* At least 3.75 (A=5.00) 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.

*Letters of Recommendation:* Three required, preferably from individuals acquainted with the applicant's recent academic work. Not required if currently enrolled in the DDS or postgraduate programs at UIC.

*Personal Statement:* Required; the statement should be a brief summary describing the applicant's area of interest, purpose, and desired department or discipline of study.

### Nondegree Applicants

Nondegree applicants must obtain approval from the Director of Graduate Studies in the College of Dentistry.

### Degree Requirements

**Minimum Semester Hours Required:** 32.

#### Coursework

*Required Courses:* Bstt 400 or equivalent; OSci 451, 452, 580, 581; at least 6 hours of OSci 598.

*Electives:* At least 6 credit hours. Courses may be chosen from any courses listed in the Graduate Catalog. Selections will be determined by the student's research area of interest.

#### Comprehensive Examination

None.

#### Thesis or Project

Thesis required. Students must earn at least 6 hours in OSci 598. No more than 20 hours of OSci 598 can be applied to the degree.



## Curriculum and Instruction

*Mailing Address: College of Education, 1040 W.*

*Harrison, M/C 147, Chicago, IL 60607-7133*

*Campus Location: 3145 ECSW*

*Telephone: (312) 996-4532*

*Curriculum Code: 5120*

*Email: scoleman@uic.edu*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Mary Bay*

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.

The College of Education also offers work leading to the Doctor of Philosophy in Education (Special Education); the Doctor of Philosophy in Educational Policy and Administration; and to three master's degrees: the Master of Education in Instructional Leadership, in Special Education, and in Leadership and Administration. Consult the appropriate chapters in this catalog for more information.

### 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of study and for all post-baccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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 these programs 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.

### Coursework

*Required Courses:* Ed 500, 501, and 502; EPsy/Ed 503. Additional required courses vary by area; contact the College of Education for the specific requirements of each area. Students specializing in curriculum design must also take four hours of CIE 574. Students specializing in reading, writing, and literacy must also take CIE 563.

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 coursework. 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 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. Students must submit the topic of their dissertation to the Committee on Educational Psychology for approval.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a graduate concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Educational Policy and Administration

*Mailing Address: College of Education, 1040 W.*

*Harrison, M/C 147, Chicago, IL 60607-7133*

*Campus Location: 3145 ECSW*

*Telephone: (312) 996-4532*

*Curriculum Code: 0520*

*Email: scoleman@uic.edu*

*Dean of the College of Education: Victoria Chou*

*Director of Graduate Studies: Mary Bay*

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.

The College of Education also offers work leading to the Doctor of Philosophy in Education (Special Education); the Doctor of Philosophy in Education (Curriculum and Instruction); and to three master's degrees: the Master of Education in Instructional Leadership, in Special Education, and in Leadership and Administration. Consult the appropriate chapters in this catalog for more information.

### 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of study and for all post-baccalaureate course work.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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 these programs 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:** 101—104 from the baccalaureate, 77—80 from the master's.

#### **Coursework**

*Required Courses:* Ed 500 and 544; PS 571, 579, 589, and 587; EPsy 503; and one additional research methods course from among EPsy 547, 563, 583, PS 570 or 587. Students must also complete a disciplinary requirement of three 400- or 500-level courses (9 to 12 semester hours) related to policy, administration, leadership, organizations, and research methods from a related discipline or field of study, to be chosen in consultation and with the consent of a faculty advisor.

*Specialization Courses:* Elementary and Secondary Education—Five courses, chosen from among PS 406, 453, 501, 551, 568, 570, 578, 581, 582, CIE 532 and 574.

Higher Education—PS 568, 574, 575, 576, and 594.

Evaluation Research and Design—CIE 545; one additional research methodology course (not taken to fulfill the core requirement) from among EPsy 546, 547, 563, or PS 587; and three courses from among CIE 532, 550, 551, 574, and Ed 543.

#### **Examinations**

*Departmental Qualifying Examination:* Required; written. Students will be eligible to take the qualifying exam after completing the Education, Research Methods, and Disciplinary cores of the program. No student with a cumulative GPA below 4.00 (A=5.00) will be permitted to take the qualifying examination. Students have two opportunities to pass all components of 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.

*Preliminary Examination:* Required. The preliminary examination is taken at the completion of all coursework. 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 Specialization in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this specialization are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member,

preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this specialization must consult the Women's Studies Graduate Director.

#### **Instructional Leadership**

*Mailing Address:* College of Education, 1040 W. Harrison, M/C 147, Chicago, IL 60607-7133

*Campus Location:* 3145 ECSW

*Telephone:* (312) 996-4532

*Curriculum Code:* 5020

*Email:* scoleman@uic.edu

*Dean of the College of Education:* Victoria Chou

*Director of Graduate Studies:* Mary Bay

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 (Type 75, supervisory); reading, writing and literacy (Type 10); or educational studies. The latter specialization allows students to pursue State of Illinois certification in either elementary (Type 03) or secondary (Type 09) education, and/ or to acquire a bilingual/ESL approval.

The College of Education also offers programs leading to the MEd in Special Education; the MEd in Leadership and Administration; the PhD in Education (Curriculum and Instruction); the PhD in Education (Special Education); and the PhD in Education (Education Policy and Administration). Consult the appropriate pages in this catalog for more information.

#### **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 3.75 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study and at least 4.00 for all post-baccalaureate coursework.

*Tests Required:* None.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required for applicants to the reading, writing, and literacy and educational studies specializations; none required for applicants to other areas.

*Personal Statement:* Required only for applicants to the educational studies specialization. The statements must be a three- to four- page double-spaced essay describing the applicant's future career plans and goals.

*Other Requirements:* At least one year of teaching or related experience is desired for applicants to the curriculum and instruction and the reading, writing, and literacy specializations. Applicants to the early childhood education specialization must complete a questionnaire from the Office of Student Services in the College of Education (room 3145, ECSWB).

#### **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.

#### **Coursework**

**Required Courses:** Curriculum and Instruction—Ed 402 or 403; Ed 421, 422, or 445; Ed 430, 431, and 490; and CIE 532 and 539. Students seeking certification must also take CIE 551, and PS 406 and 550.

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 coursework 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; 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 or Project**

None.

#### **Interdepartmental Specialization in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this specialization are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this specialization must consult the Women's Studies Graduate Director.

## **Leadership and Administration**

**Mailing Address:** College of Education, 1040 W. Harrison, M/C 147, Chicago, IL 60607-7133

**Campus Location:** 3145 ECSW

**Telephone:** (312) 996-4532

**Curriculum Code:** 0420

**Email:** scoleman@uic.edu

**Dean of the College of Education:** Victoria Chou

**Director of Graduate Studies:** Mary Bay

The College of Education offers work leading to the Master of Education in Leadership and Administration (option for type 75 administrative certificate). The college also offers programs leading to the MEd in Instructional Leadership, the MEd in Special Education, the PhD in Education (Curriculum and Instruction), the PhD in Education (Special Education); the PhD in Education (Educational Policy and Administration). Consult the appropriate pages 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 3.75 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study and at least 4.00 for all post-baccalaureate work.

**Tests Required:** None.

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Not required.

**Personal Statement:** Not required.

#### **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.

#### **Coursework**

**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 or Project**

None.

#### **Interdepartmental Specialization in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this specialization are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this specialization must consult the Women's Studies Graduate Director.

## **Special Education**

**Mailing Address:** College of Education, 1040 W. Harrison, M/C 147, Chicago, IL 60607-7133

**Campus Location:** 3145 ECSW

**Telephone:** (312) 996-4532

**Curriculum Codes:** 3520 (MEd), 4120 (PhD)

**Email:** scoleman@uic.edu

**Dean of the College of Education:** Victoria Chou

**Director of Graduate Studies:** Mary Bay

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 hours students can obtain the State of Illinois teaching certificate in the following areas: learning disabilities, socially/emotionally disturbed, educable mentally handicapped, or trainable mentally handicapped.

The College of Education also offers programs leading to the MEd degree in Instructional Leadership; the MEd in Leadership and Administration; the PhD in Education (Curriculum and Instruction); and the PhD in Educational Policy and Administration. Consult the appropriate chapters in this catalog for more information.

#### **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. Applicants must have completed SpEd 410 and CIE 460 or their equivalents with a grade of B or better.

**Grade Point Average:** At least 3.75 (A=5.00) for the final 60 semester hours (90 quarter hours) of study, and at least 4.00 (A=5.00) for all post-baccalaureate course work.

**Tests Required:** None.

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Three required.

**Personal Statement:** Required; 300 words; the statement should address the applicant's future career plans in relation to the special education degree.

#### Doctor of Philosophy

**Baccalaureate Field:** No restrictions.

**Grade Point Average:** At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of study and for all post-baccalaureate course work.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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 these programs 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:** 32 for the MEd (additional hours are required for state certification).

#### Coursework

**Required Courses:** Ed 402 or 403; Ed 421 or 422 or 445; Ed 430 or 431; SpEd 424, 426, 442, 500, and 538. Students entering the program with a prior degree in education received within 6 years of application take courses in two of the three core areas: foundations of education, educational psychology, and curriculum theory. Students seeking certification must also take 6 hours in each area of exceptionality for which they are seeking certification. Students seeking early childhood handicapped approval must also take SpEd 506, 507, 508, and 509. Students seeking special education supervisory endorsement must also take CIE 551, PS 550, and SpEd 561.

#### Comprehensive Examination

None.

#### Thesis or Project

None.

#### Other Requirements

Students must complete an internship. Students seeking state certification must enroll in SpEd 538 for 6 semester hours; all other students must enroll in SpEd 538 for 3 semester hours. Student teaching is required for those seeking their first standard teaching certificate.

#### Doctor of Philosophy

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

#### Coursework

**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 coursework. 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 Specialization in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this specialization are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this specialization must consult the Women's Studies Graduate Director.



## Bioengineering

*Mailing Address: Department of Bioengineering, 851 S. Morgan, M/C 063, Chicago, IL 60607-7052*

*Campus Location: 1021 SEO*

*Curriculum Code: 6522*

*Telephone: (312) 996-2331*

*Email: bioe@uic.edu*

*Head and Director of Graduate Studies: Richard L. Magin*

Work is offered leading to the Master of Science and the Doctor of Philosophy in Bioengineering. Areas of focus include the application to living systems of the principles and methods of medical signal image processing and control theory; medical visualization; rehabilitation; image formation and pattern recognition; bioinstrumentation; biomaterials processing and characterization; biomechanics; and pulmonary biophysics.

### 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:* Engineering or science. Prior academic work must include at least 1 year of physiology or other suitable health science, with at least one semester of laboratory work.

*Grade Point Average:* At least 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required.

*Personal Statement:* Not required.

Doctor of Philosophy

*Baccalaureate Field:* Physical sciences, engineering, 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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required.

*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.

#### Coursework

At least four courses must be at the 500 level, excluding Bioe 595, 596, or 598.

*Required Courses:* 2 hours of Bioe 595. Additional required courses vary by area; contact the department for the specific requirements of each area.

#### Comprehensive Examination

None

#### Thesis or Project

Thesis required. 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.

#### Coursework

At least 32 hours must be at the 500 level, excluding Bioe 599.

*Required Courses:* PhyB 401 and 402; and 2 hours 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, 810 S. Clinton, M/C 110, Chicago, IL 60607-7000*

*Campus Location: 204 CEB*

*Curriculum Code: 0622*

*Telephone: (312) 996-3425*

*Email: kmilla@uic.edu*

*Head of the Department: Irving Miller*

*Director of Graduate Studies: 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, and 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study for the master's program, and at least 4.50 for the doctoral program. In exceptional cases, applicants with averages below 4.00 but above 3.75 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.

*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.

#### Coursework

At least 12 semester hours must be at the 500 level.

*Required Courses:* ChE 410, 445, 527, 502, 510 or 511 or 512, and either 592 or 598.

#### Comprehensive Examination

Required only for students who do not write a thesis.

### ***Thesis or Project***

Thesis optional.  
Doctor of Philosophy

**Minimum Semester Hours Required:** 108 from the baccalaureate.

### ***Coursework***

At least 24 semester hours must be at the 500 level.

**Required Courses:** ChE 410, 445, 527, 502, 510 or 511 or 512. 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, 842 W. Taylor, M/C 246, Chicago, IL 60607-7023

**Campus Location:** 2095 ERF

**Curriculum Code:** 1322

**Telephone:** (312) 996-3428

**Email:** mdoorey@uic.edu

**Head of the Department:** Chien H. Wu

**Director of Graduate Studies:** Mohsen A. Issa

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** GRE General.

**Minimum TOEFL Score:** 600.

**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.

### ***Coursework***

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 or Project***

Thesis optional.

Doctor of Philosophy

**Minimum Semester Hours Required:** 112 from the baccalaureate.

### ***Coursework***

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.

## **Electrical Engineering and Computer Science**

**Mailing Address:** Department of Electrical Engineering and Computer Science, 851 S. Morgan, M/C 154, Chicago, IL 60607-7053

**Campus Location:** Department Office 1120 SEO; Student Affairs Office 900 SEO

**Curriculum Code:** 1622

**Telephone:** (312) 413-2290 or (312) 996-2291

**Email:** grad-info@eecs.uic.edu

**Head of the Department:** Wai-Kai Chen

**Director of Graduate Studies:** Gyan C. Agarwal

The Department of Electrical Engineering and Computer Science offers graduate programs leading to Electrical Engineering and Computer Science degrees at the master's and doctoral levels. Consult the EECS Graduate Student Manual for current requirements, policies, and regulations. Updated information about the faculty, staff, curriculum and courses is found on the EECS home page at the following address: <http://www.eecs.uic.edu>.

The department offers a comprehensive range of courses in the field of electrical engineering, computer engineering, and computer science. 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, compilers and programming languages, software engineering, database systems, graphics and human-computer interaction, computer vision, artificial intelligence, theoretical computer science, computer architecture, VLSI design, computer networks, and operating systems.

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, computer science, or other closely related curriculum.

*Grade Point Average:* At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE scores are not required for admission consideration. Applicants planning to seek a University Fellowship or other financial support (department fellowship/TA/RA/TFW) must submit general GRE scores. For computer science applicants, the subject area GRE is recommended. 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.

*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, computer engineering, or computer science.

*Grade Point Average:* At least 4.50 (A=5.00).

*Tests Required:* GRE general scores are not required for admission consideration. Applicants planning to seek a University Fellowship or other financial support (department fellowship/TA/RA/TFW) must provide GRE general scores. For computer science applicants, the subject area GRE is recommended. Graduates of non-English-speaking countries requesting TA consideration must submit a TSE score (minimum acceptable score is 50).

*Minimum TOEFL Score:* 570.

*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.

### **Coursework**

At least 24 hours must be in courses offered by the Department of Electrical Engineering and Computer Science, 12 of which must be EECS offerings at the 500 level (excluding EECS 595-599). A maximum of 8 semester hours of credit obtained from seminar, independent study, and project research (EECS 595, 596, and 597) or a maximum of 12 semester hours of credit obtained from seminar, independent study, and thesis research (EECS 595, 596, and 598) can be applied for credit towards the MS degree. No more than one special topics course (EECS 594) can be counted toward the 500-level requirement.

### **Comprehensive Examination**

None.

### **Thesis or Project**

Required. Thesis students must earn at least 8 hours in EECS 598; no more than 12 hours of EECS 598 can be applied to the degree. For students who elect the project option, no more than 4 hours of EECS 597 can be applied to the degree.

Doctor of Philosophy

**Minimum Semester Hours Required:** 108 from the baccalaureate.

### **Coursework**

At least 28 hours must be in graduate-level courses, 16 of which must be EECS course offerings at the 500 level (excluding EECS 595—599). Students with master's degrees from other institutions should note that this coursework must be beyond the MS level and any course taken in EECS that is nearly equivalent to the one taken in the MS program earlier will not be counted toward final PhD credit calculations.

### **Examinations**

*Departmental Qualifying Examination:* Required; written.

*Preliminary Examination:* Required; oral.

### **Dissertation**

Required. Candidates must earn at least 44 hours in EECS 599.

### **Fellowships**

The department offers five doctoral fellowships each year for 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.

## **Geotechnical Engineering and Geosciences**

*2460 Science and Engineering Offices*

*Curriculum Code:* 1722

*(312) 996-3154*

*Director of Graduate Studies:* Carol Stein

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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.

#### Coursework

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. 5 of the engineering hours must be in CEMM courses; the other 5 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 Engineering, 842 W. Taylor, M/C 251, Chicago, IL 60607-7022

*Campus Location:* 2041 ERF

*Curriculum Codes:* 2722 (MS), 2822 (PhD)

*Telephone:* (312) 996-6122

*Email:* megrad@uic.edu

*Head of the Department:* Selcuk Guceri

*Director of Graduate Studies:* Krishna Gupta

The Department of Mechanical Engineering offers work leading to the Master of Science in Industrial Engineering and the Doctor of Philosophy in Industrial Engineering and Operations Research. Coursework 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. A grade point average of at least 4.50 is preferred for applicants to the PhD program.

*Tests Required:* None. Students seeking a teaching or research assistantship are strongly encouraged to take the GRE general.

*Minimum TOEFL Score:* 550.

*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.

#### Coursework

*Coursework 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 or Project

Thesis required for students in the thesis option. 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.

#### Coursework

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, 842 W. Taylor, M/C 246, Chicago, IL 60607-7023

*Campus Location:* 2095 ERF

*Curriculum Code:* 3822

*Telephone:* (312) 996-3428

*Email:* mdoorey@uic.edu

*Head of the Department:* Chien H. Wu

*Director of Graduate Studies:* Mohsen A. Issa

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 EECS 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600.

*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.

#### **Coursework**

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 or Project**

Thesis required. 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.

#### **Coursework**

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 Engineering, 842 W. Taylor, M/C 251, Chicago, IL 60607-7022

*Campus Location:* 2041 ERF

*Curriculum Code:* 3122

*Telephone:* (312) 996-6122

*Email:* megrad@uic.edu

*Head of the Department:* Selcuk Guceri

*Director of Graduate Studies:* Krishna Gupta

The Department of Mechanical 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.

Coursework 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study. A grade point average of at least 4.50 is preferred for applicants to the PhD program.

*Tests Required:* None. Students seeking a teaching or research assistantship are strongly encouraged to take the GRE general.

*Minimum TOEFL Score:* 550.

*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: coursework only, or thesis.

**Coursework**

*Coursework 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 or Project**

Thesis required for students in the thesis option. 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.

**Coursework**

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, 1007 W. Harrison, M/C 027, Chicago, IL 60607-7139*

*Campus Location: 2102 BSB*

*Curriculum Code: 0132*

*Telephone: (312) 413-3570*

*Email: anthro@uic.edu*

*Chair of the Department: Lawrence Keeley*

*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 women's studies is available to students in this program, as well as an interdepartmental concentration in Latin American/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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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 M.A. or equivalent, from an accredited college or university, in the US or abroad.

*Grade Point Average:* At least 4.0 (A=5.0) for the final semester hours (90 quarter hours) of undergraduate study.

*Tests required:* GRE scores are required.

*Minimum TOEFL Score:* 550.

*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.

### Coursework

*Required Courses:* Anth 500, 501, 502, and 503.

Candidates must complete the four core courses with a grade of B or better. Courses must be completed within first three semesters.

*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 the four core courses constitute the four sections of the comprehensive examination.

### Thesis or Project

Project optional.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### Interdepartmental Concentration in Latin American/Latino Studies

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

**Doctor of Philosophy**

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

### Coursework

*Required Courses:* Anth 500, 501, 502, and 503.

Candidates must complete the four core courses with a grade of B or better. Courses must be completed within the first three semesters.

### Examinations

*Preliminary Examination:* Required, written.

### Dissertation

Required.

### Other Requirements

Students must demonstrate a reading knowledge of a research language.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### Interdepartmental Concentration in Latin American/Latino Studies

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the

student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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, 845 W. Taylor, M/C 066, Chicago, IL 60607-7060*

*Campus Location: 3250 SES*

*Curriculum Code: 3332*

*Telephone: (312) 996-2931*

*Email: gradbios@uic.edu*

*Acting Head of the Department: Lon Kaufman*

*Director of Graduate Studies: Leo Miller*

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 coursework deficiencies by enrolling in undergraduate classes during their first year.

**Grade Point Average:** At least 4.00 (A=5.00) 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.

**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 coursework. (*Note: until further notice, no new students will be admitted to the coursework track.*)

### Research Track

**Minimum Semester Hours Required:** 32.

#### Coursework

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. BioS 594 may be included in the 22 credit hours, but not toward the 9 credit hours of letter-graded 500-level courses.

#### Comprehensive Examination

Required; oral.

#### Thesis or Project

Thesis required. At least 4 semester hours, but not more than 10 hours, of Bios 598 can be applied to the degree.

### Coursework Track

**Minimum Semester Hours Required:** 32.

#### Coursework

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. BioS 594 courses may be included in the 24 credit hours but not toward the 9 credit hours of letter graded 500 level courses.

#### Comprehensive Examination

Required; oral.

#### Thesis or Project

Project required. 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

#### Coursework

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

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.

#### Coursework

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. BioS 594 may be included in the 22 credit hours, but not toward the 8 credit hours of letter-graded 500-level courses.

#### 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, 845 W. Taylor, M/C 111, Chicago, IL 60607-7061*

*Campus Location: 4500 SES*

*Curriculum Code: 0732*

*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 4.00 (A=5.00) in mathematics and science courses other than independent study or research courses. At least 3.75 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.

*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: coursework only, examination, or thesis.

#### Coursework

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 coursework-only option must complete all coursework 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 or Project

Thesis optional. Students who do not submit a thesis must fulfill the requirements of either the coursework-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.

#### Coursework

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, 1040 W. Harrison, M/C 132, Chicago, IL 60607-7131*

*Campus Location: 1021 ECSW*

*Curriculum Code: 4732*

*Telephone: (312) 413-2199*

*Email: huiching@uic.edu*

*Head of the Department: Steve Jones*

*Director of Graduate Studies: Hui-Ching Chang*

The Department of Communication offers work leading to the Master of Arts in Communication. An interdepartmental concentration in women's studies is 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 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600.

*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

Nondegree applicants must submit a transcript from their baccalaureate institution.

### Degree Requirements

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

**Minimum Semester Hours Required:** 32.

#### Coursework

At least 20 hours must be at the 500 level. Credit in Comm 474 cannot be applied to the degree. Students who receive more than one grade below B in their graduate coursework, 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.

*Electives:* No more than 8 hours may be taken in courses outside the department, and no more than 6 hours may be in Comm 596.

#### Comprehensive Examination

None.

#### Thesis or Project

Thesis required. Students must earn at least 8 hours in Comm 598.

#### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies

advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

(Note: The department has approved a modification of the degree requirements for the MA. These changes are currently pending University approval. For the most current information, students should contact the department.)

## Criminal Justice

*Mailing Address: Department of Criminal Justice, 1007 W. Harrison, M/C 141, Chicago, IL 60607-7140*

*Campus Location: 4022 BSB*

*Curriculum Code: 3832*

*Telephone: (312) 996-2383*

*Email: joepete@uic.edu*

*Head of the Department: Dennis P. Rosenbaum*

*Director of Graduate Studies: Joseph L. Peterson*

The Department of Criminal Justice offers work leading to the Master of Arts and the Doctor of Philosophy in Criminal Justice. The Master of Arts program 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 to provide educational opportunities for careers in research, evaluation and criminal justice administration. An interdepartmental concentration in women's studies is available to students in this program.

Building on the above general curricular areas, the Doctor of Philosophy degree offers additional coursework in theory, substantive specialties, and research methods. Concentrations are offered in law and society, criminology and organizations.

*Note:* Modifications to the Master of Arts and the Doctor of Philosophy are presently under consideration and students are advised to contact the Director of Graduate Studies for the most current admission and degree requirements.

The Department of Criminal Justice also co-sponsors, with the College of Pharmacy, a program leading to the Master of Science in Forensic Sciences; 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 4.00 (A=5.00) 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.

*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 4.00 but higher than 3.75, 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.

#### Non degree applicants

Nondegree applicants must submit transcripts from all colleges and universities attended in the eight last years.

#### Doctor of Philosophy

*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 4.0 (A=5.0) for the final 60 semester hours (90 quarter hours) of undergraduate study, with a GPA of at least 4.25 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.

*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.

*Other requirements:* Applicants must submit a sample of their academic writing.

### 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.

##### Coursework

*Required Courses:* CrJ 500, 520 or 521, 540, 560, 561, and 570.

*Electives:* At least 16 semester hours. At least half of the elective hours must be at the 500 level.

*Comprehensive Examination:* Required.

*Thesis or Project:* None.

#### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### Doctor of Philosophy

A minimum of 96 semester hours of graduate work beyond the baccalaureate is required. 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. Any required courses waived on transfer of credit will, however, be covered in the qualifying examination. Dissertation research may receive up to 20 semester hours of credit.

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

##### Coursework

*Required Courses:* CrJ 500, 520 or 521, 540, 560, 561 and 570.

*Electives:* Upon successful completion of the core curriculum and the qualifying examination, students are required to complete nine additional courses, including three courses outside the department. Students may choose from among three areas of concentration: Law and Society, Criminology, and Organizations.

##### Examinations

*Departmental Qualifying Examination:* Required.

*Preliminary Examination:* Required.

*Dissertation:* Required.

## Earth and Environmental Sciences

(formerly Geological Sciences)

*Mailing Address: Department of Earth and Environmental Sciences, 845 W. Taylor, M/C 186, Chicago, IL 60607-7059*

*Campus Location: 2460 SES*

*Curriculum Code: 1632*

*Telephone: (312) 996-3154*

*Email: carol@ocean.geol.uic.edu*

*Head of the Department: A.F. Koster Van Groos*

*Director of Graduate Studies: Carol A. Stein*

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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.

#### Coursework

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 or Project

Thesis required. No more than 8 hours of EaES 598 can be applied to the degree.



## English

*Mailing Address: Department of English, 601 S. Morgan, M/C 162, Chicago, IL 60607-7120*

*Campus Location: 2000 UH*

*Curriculum Code: 1132*

*Telephone: (312) 413-2239*

*Email: tbestul@uic.edu*

*Head of the Department: Donald G. Marshall*

*Director of Graduate Studies: Thomas H. Bestul*

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 and American literature; creative writing; language, literacy, and rhetoric; and the teaching of English (master's only).

An interdepartmental concentration in women's studies and an interdepartmental concentration in Latin American/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; 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: Master of Arts

**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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study and for all graduate work.

**Tests Required:** GRE general and GRE subject test in literature.

**Minimum TOEFL Score:** 550.

**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 250 words presenting their reasons for wanting to take graduate work in English and the relationship of this advanced training to professional and other goals. Foreign 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 United States.

**Other Requirements:** All MA and PhD applicants must submit a sample of their written work 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 this program is earlier than the Graduate College deadline; contact the program for information on current deadlines.

## Degree Requirements

Master of Arts

**Minimum Semester Hours Required:** 32.

### Coursework

At least 12 of the 32 hours must be at the 500 level, and at least 24 of the 32 hours must be in English. 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.

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, 556, Ling 483, 554, 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 or Project

Project required. 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; no credit in Engl 597 is given for completion of the qualifying manuscript.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### ***Interdepartmental Concentration in Latin American/Latino Studies***

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

Doctor of Philosophy

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

#### ***Coursework***

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 coursework in periods that would strengthen their general background and coursework in those periods or genres related to their chosen area. They are urged to take additional coursework 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 advanced knowledge of a language other than English and of its literature or culture, or evidence of reading knowledge of one major ancient or modern European language and of a second 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 Women's Studies***

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### ***Interdepartmental Concentration in Latin American/Latino Studies***

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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**

(formerly Geography)

***Mailing Address:*** Department of Anthropology, 1007 W. Harrison, M/C 027, Chicago, IL 60607-7138

***Campus Location:*** 2102 BSB

***Curriculum Code:*** 1532

***Telephone:*** (312) 996-3112

***Email:*** cliff@uic.edu

***Chair of the Department:*** Lawrence Keeley

***Director of Graduate Studies:*** C.E. Tiedemann

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* GRE general scores.

*Minimum TOEFL Score:* 550.

*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.

#### Coursework

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. Non-thesis students must take 8 semester hours in geographic information systems or cartography and remote sensing.

*Electives:* Non-thesis 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 non-thesis students; outside courses must support the student's major.

#### Comprehensive Examination

Required only for students who do not complete a thesis; written.

#### Thesis or Project

Thesis optional. 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.

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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Letters of Recommendation:* Three required.

*Personal Statement:* Required; 250 words, in French; the statement should address the applicant's reasons for wanting to take graduate work.

### Degree Requirements

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

**Minimum Semester Hours Required:** 32.

#### Coursework

At least 12 of the 32 hours must be at the 500 level, of which 8 must be regularly scheduled course work. At least 24 hours of course work must be taken in the department.

*Required Courses:* 4 hours from among Fr 415, 416, 417, 418, 419, 420, or 422; 4 hours from among Fr 461, 462, or 463; and 4 hours from among Fr 433, 446, or 531.

*Electives:* Students must take an additional 12 hours in one of three areas, distributed as follows:

Literary studies—Fr 510, and 8 additional hours in literature.

Civilization studies—Fr 560, plus 4 hours of civilization and 4 hours of literature.

Language studies—Fr 433 and 530, and 4 hours of literature.

#### Comprehensive Examination

Required; written and oral.

#### Thesis or Project

Thesis optional. Thesis students must earn at least 8 hours in Fr 598.

#### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## French

*Mailing Address:* Department of Spanish, French, Italian, and Portuguese, 601 S. Morgan, M/C 315, Chicago, IL 60607-7116

*Campus Location:* 1623 UH

*Curriculum Code:* 1332

*Telephone:* (312) 996-3221

*Email:* carlap@uic.edu

*Interim Head of the Department:* Lucia Elias-Olivares

*Director of Graduate Studies:* Peter Conroy

The Department of Spanish, French, Italian, and Portuguese offers work leading to the Master of Arts in French. An interdepartmental concentration in 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

## Geography

(see *Environmental and Urban Geography*)

## Geological Sciences

(see *Earth and Environmental Sciences*)

## German

*Mailing Address: Department of German, 601 S. Morgan, M/C 189, Chicago, IL 60607- 7115*  
*Campus Location: 1526 UH*  
*Curriculum Code: 5732*  
*Telephone: (312) 996-3205*  
*Email: mrsmcq@uic.edu*  
*Head of the Department: Helga W. Kraft*  
*Director of Graduate Studies: Marian R. Sperberg-McQueen*

The Department of German offers work leading to the Master of Arts degree in German and participates with the Department of Germanic Languages at the University of Illinois at Urbana-Champaign in an intercampus program leading to the degree of Doctor of Philosophy. An interdepartmental concentration in women's studies is available to students in both the master's and doctoral programs. Students may augment their study of German literature and language with courses focusing on cultural history, gender studies, and foreign language pedagogy.

### 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 is expected, as is proficiency in written and spoken German.

*Grade Point Average:* At least 4.00 (A=5.00) in all German courses and in the final 60 semester hours (90 quarter hours) of undergraduate study.

*Tests Required:* None.

*Minimum TOEFL Score:* 550.

*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.

#### Coursework

At least 12 hours must be at the 500 level. These courses will be chosen from Ger 511, 512, 513, 514, and 531. Ger 407 is recommended for those planning a teaching career.

#### Comprehensive Examination

Required for students who do not complete a thesis; written and oral.

#### Thesis or Project

Thesis optional; requires the permission of the department. No more than 8 hours of Ger 598 can be applied to the degree.

#### Other Requirements

All students will be tested for their proficiency in German; students who do not pass this test may be required to take language courses.

#### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes

the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

Doctor of Philosophy

**Minimum Semester Hours Required:** 64 beyond the master's degree.

#### Coursework

32 hours exclusive of credit for thesis research.

#### 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.

#### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this specialization are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Hispanic Studies

*Mailing Address: Department of Spanish, French, Italian, and Portuguese, 601 S. Morgan, M/C 315, Chicago, IL 60607-7117*

*Campus Location: 1733 UH*

*Curriculum Code: 3432*

*Telephone: (312) 996-3236*

*Email: rocio.garcia@uic.edu*

*Interim Head of the Department: Lucia Elias-Olivares*

*Director of Graduate Studies: James Maharg*

The Department of Spanish, French, Italian, and Portuguese offers work leading to degrees in Hispanic Studies at both the master's and doctoral levels. Three specializations are offered at the master's level: Hispanic Interdisciplinary Studies, Hispanic Literary Studies, and Hispanic Linguistics. At the doctoral level specializations are available in Hispanic Literatures and Cultures or Hispanic Linguistics. An interdepartmental concentration in Latin American/Latino Studies is available to students in this program. 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.

*Grade Point Average:* At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of study.

*Tests Required:* Applicants must pass a department qualifying examination that tests accuracy and comprehension in formal standard Spanish. This examination will be scheduled by the graduate director after the applicant has met all other admission requirements. The qualifying examination may be attempted twice. Applicants are urged to take the GRE.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required from former professors; at least two should be from teachers in upper-level Spanish courses.

*Personal Statement:* Required; 250 words; the statement should address the applicant's choice of one of the three master's options and the applicant's reasons for wanting to take graduate work in Spanish and in the option selected.

Doctor of Philosophy

*Baccalaureate Field:* Spanish.

*Grade Point Average:* At least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of study. For applicants with a master's degree, at least 4.00 for all graduate courses.

*Tests Required:* Applicants are urged to take the GRE.

*Minimum TOEFL Score:* 550.

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

*Personal Statement:* Required; the statement should summarize the applicant's academic or professional work and career objectives.

*Other Requirements:* All students must present evidence of both advanced knowledge of a modern Romance language in addition to Spanish and a reading knowledge of one major ancient or modern European language. Applicants with a deficiency in these language requirements must pass a qualifying examination no later than the end of the first year of study. 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.)

### 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:** 32.

### Coursework

*Required Courses:* Span 402 and 500 are required for all specializations.

*Specialization Courses:* Hispanic Literary Studies—Six courses (24 hours), including at least two courses at the 500 level, chosen in consultation with the graduate advisor.

Hispanic Interdisciplinary Studies—Span 535, and five courses (20 hours), including at least one at the 500 level, two of which may be taken outside the department. Courses must be chosen in consultation with the graduate advisor.

Spanish Descriptive Linguistics—Span 404 and 505, and four courses (16 hours), one of which must be in literature, all chosen in consultation with the graduate advisor. One course must be at the 500 level.

Spanish Applied Linguistics—Span 404, 453, and 507, and three courses (12 hours) chosen in consultation with the graduate advisor, one of which must be at the 500 level.

### Comprehensive Examination

Required.

### Thesis or Project

Thesis optional; permission of the department's graduate committee is required.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### Interdepartmental Concentration in Latin American/Latino Studies

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

Doctor of Philosophy

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

### Coursework

*Required Courses:* Span 402, 414, 450 and 500.

*Electives:* vary by specialization.

Hispanic Literature and Cultures—Span 400; one course, which may be taken outside the department, from among the following: Culture of Spain, Culture of Latin America, or Theory and Practice of Literary Criticism; four graduate courses offered by the department; three courses taken outside of the department, two of which must be related to the field of specialization.

Hispanic Linguistics—Span 403 and 405; one course in Spanish or Latin American Literature; of the remaining 24 hours, 12 hours are allowed in the student's major area, and 12 hours in courses taken outside the department, of which 8 hours must be in general linguistic theory.

### 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 intermedi-

ate Spanish.

#### ***Interdepartmental Concentration in Women's Studies***

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### ***Interdepartmental Concentration in Latin American/Latino Studies***

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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, 601 S. Morgan, M/C 198, Chicago, IL 60607-7109*

*Campus Location: 913 UH*

*Curriculum Codes: 1932 (MA, PhD), 8032 (MAT)*

*Telephone: (312) 996-3141*

*Email: lindavp@uic.edu*

*Chairperson of the Department: Michael Perman*

*Director of Graduate Studies: Mary Kay Vaughan*

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 women's studies and an interdepartmental concentration in Latin American/Latino Studies are available to both MA and PhD students.

Students must select one of the following major fields for the MA: Africa, ancient world, early modern Europe, East Asia, Great Britain, Latin America, medieval Europe, modern Europe, Russia and East Europe, and the United States. The PhD major fields are Africa, Britain since 1485, Europe 1450—1815, Europe since 1648, France, Latin America, Russia, United States 1500—1877, and the United States since 1765. 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, and at least two years of undergraduate training in a foreign language.

**Grade Point Average:** at least 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** GRE general. The GRE subject test in history is also recommended, but not required.

**Minimum TOEFL Score:** 550

**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.

#### ***Coursework***

At least 16 hours must be at the 500 level and in the field of history. Courses taken in a field other than history that are to count towards 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 receives 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, 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.

#### ***Comprehensive Examination***

Required.

#### ***Thesis or Project***

None.

#### ***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.

#### ***Interdepartmental Concentration in Women's Studies***

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### ***Interdepartmental Concentration in Latin American/Latino Studies***

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

Master of Arts in the Teaching of History

**Minimum Semester Hours Required:** 32.

#### ***Coursework***

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 or Project**

None.

Doctor of Philosophy

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

#### **Coursework**

Candidates must complete at least 64 semester hours of graduate work beyond the master's degree. Of this amount, 32 semester hours are in didactic courses and 32 semester hours are in thesis research. 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.

#### **Examinations**

**Comprehensive Examination:** Students admitted to the program who do not have a master's degree in history may be required to take the master's comprehensive examination. After the first term in residence, they may also be required to take an oral examination.

**Preliminary Examination:** Required; written and oral.

#### **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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### **Interdepartmental Concentration in Latin American/Latino Studies**

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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, 601 S. Morgan, M/C 162, Chicago, IL 60607-7120

**Campus Location:** 2004 UH

**Curriculum Code:** 2332

**Telephone:** (312) 413-2240

**Email:** vdavis@uic.edu

**Head of the Department:** Donald Marshall

**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. Coursework in general linguistics focuses on language, culture, and society; coursework in applied linguistics focuses on TESOL (Teaching of English to Speakers of Other Languages). An interdepartmental concentration in 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 4.00 (A=5.00) 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. For tests taken before July 1, 1995, a score of at least 230 is required.

**Minimum TOEFL Score:** 590.

**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.

#### **Coursework**

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; 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 or Project**

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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## **Mathematics**

*Mailing Address: Department of Mathematics, Statistics, and Computer Science, 851 S. Morgan, M/C 249, Chicago, IL 60607-7045*

*Campus Location: 335 SEO*

*Curriculum Codes: 2432 (MA, MS, PhD, DA), 7832 (MST)*

*Telephone: (312) 996-3041*

*Email: kdueball@uic.edu*

*Head of the Department: Henri Gillet*

*Director of Graduate Studies: David Marker*

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, and the teaching of mathematics. Additional information, guidelines, and requirements are published annually in the department's Graduate Handbook.

#### **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=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate

study, and an average of 4.00 in all mathematics courses beyond calculus.

**Tests Required:** GRE general and GRE subject test in mathematics (computer science if area).

**Minimum TOEFL Score:** 550.

**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 following courses: Advanced Calculus, Linear Algebra I, Abstract Algebra I.

**Grade Point Average:** At least 3.75 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 4.00 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.

**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=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 4.00 in all mathematics courses beyond calculus.

**Tests Required:** GRE general and GRE subject test in mathematics.

**Minimum TOEFL Score:** 550.

**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.

#### **Coursework**

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 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 coursework 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 or Project**

Thesis optional. Students who do not complete a thesis must pass a written comprehensive examination.

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.

**Coursework**

**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 or Project**

None.

**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.

**Coursework**

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.

**Coursework**

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**

Students must demonstrate a reading proficiency in French, German, Russian, or another language approved by the Graduate Studies Committee.

## Philosophy

**Mailing Address:** Department of Philosophy, 601 S. Morgan, M/C 267, Chicago, IL 60607-7114

**Campus Location:** 1421 UH

**Curriculum Code:** 2732

**Telephone:** (312) 996-3023

**Email:** val@uic.edu

**Acting Chairperson of the Department:** William 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 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 4.00 (A=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None. The GRE is recommended.

**Minimum TOEFL Score:** 550.

**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 4.00 (A=5.00) 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.

### Coursework

At least 24 hours must be in courses at the 500 level. At least 24 hours must be in courses in the department, of which at least 20 must be at the 500 level (excluding Phil 593 and 596). Students must receive a "B" or better in one course in the history of philosophy, one course in metaphysics/epistemology (logic, philosophy of science, philosophy of language), and one course in ethics, political philosophy, or aesthetics.

### Comprehensive Examination

None.

### Thesis or Project

None.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

Doctor of Philosophy

**Minimum Semester Hours Required:** 96 for students entering with a baccalaureate, and 64 for students entering with a master's.

### Coursework

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:** Proficiency in logic at the level of Phil 210 or above (or satisfactory completion of an exam).

### 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 Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Physics

**Mailing Address:** Department of Physics, 845 W. Taylor, M/C 273, Chicago, IL 60607-7059

**Campus Location:** 2236 SES

**Curriculum Code:** 5432

**Telephone:** (312) 996-3400

**Email:** piwo@uic.edu

**Head of the Department:** Uday Sukhatme

**Director of Graduate Studies:** James S. Kouvel

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 and molecular physics; condensed matter physics; environmental physics; high-energy physics; laser physics; medical physics and biophysics; and 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=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 580.

*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.

#### **Coursework**

At least 20 hours must be at the 500 level, of which no more than 4 hours may be in Phys 596 and no more than 8 hours may be in Phys 598.

*Required Courses:* Phys 501, 502, 511, and 512.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Thesis optional. 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.

#### **Coursework**

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 or Phys 521 and 522 or 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, 1007 W. Harrison, M/C 276, Chicago, IL 60607-7137

*Campus Location:* 1119 BSB

*Curriculum Codes:* 3132 (MA), 3126 (PPA PhD)

*Telephone:* (312) 996-3105

*Email:* getzov@uic.edu

*Acting Head of the Department:* Andrew Mc Farland

*Director of Graduate Studies:* Gerald Strom

The department of Political Science offers work leading to the Master of Arts in Political Science and the Doctor of Philosophy in Public Policy Analysis with a specialization in political science. An interdepartmental concentration in women's studies and an interdepartmental concentration in Latin American/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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*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.

#### **Coursework**

*Required Courses:* PolS 401, 404, 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 or Project**

Thesis optional. Students electing the thesis option must earn at least 8 hours in PolS 598.

#### **Interdepartmental Concentration in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

#### **Interdepartmental Concentration in Latin American/Latino Studies**

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAST 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

Doctor of Philosophy in Public Policy Analysis

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

#### **Coursework**

*Required Courses:* PPA 500, 540, 541, and 590; and PolS



401, 402, 404, and 582.

### **Examinations**

**Departmental Qualifying Examination:** Required. Not later than two calendar years after admission or the completion of 32 semester hours (whichever comes first), students must take a qualifying exam covering the material in the following courses: PoIS 402 and 404; PPA 500, 540, and 541. Students who fail on the first attempt may retake the exam a second time. The third exam is not permitted. The exam is offered twice per year, in December and in May. Students with exceptionally high grade point averages in the courses covered on the qualifying exam may petition the graduate committee for a waiver of the qualifying examination requirement.

**Preliminary Examination:** Required. After successful completion of the qualifying exam, students will select four fields and take a preliminary examination. The preliminary exam will consist of a written examination in each field.

### **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**

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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### **Interdepartmental Concentration in Latin American/Latino Studies**

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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, 1007 W. Harrison, M/C 285, Chicago, IL 60607-7137

**Campus Location:** 1066 BSB

**Curriculum Code:** 4032

**Telephone:** (312) 996-2434

**Email:** pschinfo@uic.edu

**Chairperson of the Department:** Alexander J. Rosen

**Director of Graduate Studies:** Roger P. Weissberg

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). 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 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 coursework 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 4.20 (A=5.00) 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.

**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.

#### **Coursework**

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 443, 541, 543, and 5 hours of Psch 591.

(Note: The department has approved a modification of the degree requirements for the M.A. and Ph.D. These changes are currently pending University approval. For the most current information, students should contact the department.)

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Thesis required.

Doctor of Philosophy

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

#### **Coursework**

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 443, 505, 541, and 543.

(Note: The department has approved a modification of the degree requirements for the M.A. and Ph.D. These changes are currently pending University approval. For the most current information, students should contact the department.)

#### **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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### **Slavic Languages and Literatures (PhD)**

**Mailing Address:** Department of Slavic and Baltic Languages and Literatures, 601 S. Morgan, M/C 306, Chicago, IL 60607-7116

**Campus Location:** 1628 UH

**Curriculum Code:** 4132

**Telephone:** (312) 996-4412

**Email:** slavbalt@uic.edu

**Head of the Department:** Sona S. Hoisington

**Director of Graduate Studies:** Biljana Sljivic-Simsic

The Department of Slavic and Baltic Languages and Literatures offers work leading to the PhD in Slavic Languages and Literature. Specializations are available in Russian, Ukrainian, Polish, Serbian, and Lithuanian language and literature. An interdepartmental concentration in 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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study and for all graduate work.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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.

#### **Coursework**

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; 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; 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 coursework in any 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 coursework 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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

### **Slavic Studies (MA)**

**Mailing Address:** Department of Slavic and Baltic Languages and Literatures, 601 S. Morgan, M/C 306, Chicago, IL 60607-7116

**Campus Location:** 1628 UH

**Curriculum Code:** 3532

**Telephone:** (312) 996-4412

**Email:** slavbalt@uic.edu

**Head of the Department:** Sona S. Hoisington

**Director of Graduate Studies:** Biljana Sljivic-Simsic

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 coursework required for certification. An interdepartmental concentration in 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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study and for all graduate work.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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:** 44.

**Coursework**

At least 36 hours must be in the student's area of specialization and 8 hours must be in courses in a related field, in or outside the department. Courses taken outside of the department must be approved by the department.

**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 8 electives in their area of specialization, of which at least 3 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. All students must take an additional two courses (8 hours) in any related field pertinent to their major area and career goals, approved by the department.

**Comprehensive Examination**

Required. The exam consists of two parts. Part I, based on both coursework and the departmental reading list, tests the student's preparedness in the chosen area of specialization. Part II tests the student's preparedness in the chosen related field. Those who fail any portion of the examination may retake it once, no later than one calendar year after the first attempt.

**Thesis or Project**

None.

**Other Requirements**

Coursework required for certification in high school teaching is in addition to the above departmental MA requirements.

**Interdepartmental Concentration in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Sociology

*Mailing Address: Department of Sociology, 1007 W. Harrison, M/C 312, Chicago, IL 60607-7140*

*Campus Location: 4112 BSB*

*Curriculum code: 4332*

*Telephone: (312) 996-3005*

*Email: 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. Coursework 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 women's studies and an interdepartmental concentration in Latin American/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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 4.50 for any previous graduate work.

**Tests Required:** GRE general test.

**Minimum TOEFL Score:** 550.

**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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study, and at least 4.50 for any previous graduate work.

**Tests Required:** GRE general test.

**Minimum TOEFL Score:** 550.

**Letters of Recommendation:** Three required; at least two should be from professors at the university where the

**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 or Project**

Project required. Students must earn at least 4 hours in Soc 597.

**Other Requirements**

Applied sociology students must complete an internship.

**Interdepartmental Concentration in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

**Interdepartmental Concentration in Latin American/Latino Studies**

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies must take at least 16 hours of course work approved by the student's adviser for the concentration, of which 4 hours must be the core seminar LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or

independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration.

Doctor of Philosophy

**Minimum Semester Hours Required:** 40-48 hours of coursework beyond the M.A.; 16-24 dissertation research hours. The minimum number of hours beyond the baccalaureate is 96.

**Coursework**

*Required courses:* M.A. in Sociology course requirements (32-40 hours depending on the student's level of preparation). Students with an M.A. from another institution must satisfy UIC sociology M.A. 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 M.A.) 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 Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

**Interdepartmental Concentration in Latin American/Latino Studies**

In addition to meeting the above requirements, students pursuing a Concentration in Latin American/Latino Studies 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 LAsT 501. The remaining 12 hours may come from courses offered by the Latin American Studies program or cross-listed courses, or departmental offerings with Latin American or Latino content, or independent study courses chosen upon consultation with the adviser. Up to 8 hours may be taken in the home discipline, although students are encouraged to take advantage of the multi-disciplinary nature of the concentration. Doctoral students may not apply dissertation credit 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.



## Anatomy and Cell Biology

*Mailing Address: Department of Anatomy and Cell Biology, 808 S. Wood, M/C 512, Chicago, IL 60612-7308*

*Campus Location: 578 CME*

*Curriculum Code: 0038*

*Telephone: (312) 996-6791*

*Email: conwell@uic.edu*

*Interim Head of the Department: Rochelle S. Cohen*

*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; neural systems; neurotransplants; 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=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*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.

#### Coursework

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 or Project

Thesis required.

#### Other Requirements

All graduate students must serve as laboratory teaching assistants each year.

Doctor of Philosophy

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

#### Coursework

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, 1819 W. Polk, Chicago, IL 60612-7334*

*Campus Location: A312 CMW*

*Curriculum Code: 0538*

*Telephone: (312) 996-7670*

*Email: mattbrow@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=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general and subject.

*Minimum TOEFL Score:* 570.

*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.

#### Coursework

Two tracks (thesis and non-thesis) are available to

students in this program.

**Required Courses:** Bche 460, 495, 520, 521, 522, 561 or 562, 595 and 599. Students enrolled in the non-thesis track must also take Bche 521, 561, and 562. Students enrolled in the thesis track must 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**

Required only for students in the non-thesis track; written.

#### **Thesis or Project**

Thesis required only for students in the thesis track. 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.

#### **Coursework**

**Required Courses:** BChe 460, 495, 520, 521, 522, 561 or 562, 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:** Required; written and oral.

#### **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.

## **Molecular Genetics**

**Mailing Address:** Department of Molecular Genetics, 900 S. Ashland Ave., M/C 669, Chicago, IL 60607-7170

**Campus Location:** 2150 MBRB

**Curriculum Code:** 4838

**Telephone:** (312) 996-6984

**Email:** prgalleg@uic.edu

**Head of the Department:** Richard L. Davidson

**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, multi drug 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 4.00 (A=5.00).

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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.

#### **Coursework**

**Required Courses:** 24 hours of didactic courses including Gene 502, 512, 513, 514, Bche 460 and 562 to be completed in the first two years. Ten (10) hours of Gene 503 and one (1) hour of Gene 501 are to be completed in the first year. One (1) 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.

## **Health Professions Education**

**Mailing Address:** Department of Medical Education, 808 S. Wood, M/C 591, Chicago, IL 60612-7309

**Campus Location:** 986 CME

**Curriculum Code:** 1438

**Telephone:** (312) 996-3590

**Email:** 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=5.00) for the final 60 semester hours (90 quarter hours) of undergraduate study.

**Tests Required:** None.

**Minimum TOEFL Score:** 550.

**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.

#### **Coursework**

**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 or Project**

Required. 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. 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**

**Mailing Address:** Department of Microbiology and Immunology, 901 S. Wood, M/C 790, Chicago, IL 60612-7344

**Campus Location:** E-703 MSB

**Curriculum Code:** 2538

**Telephone:** (312) 996-9477

**Email:** 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 procaryotes; 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=5.00) for the

final 60 semester hours (90 quarter hours) of undergraduate study. Preference is given to applicants who have a GPA greater than 4.00.

**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.

**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.

**Required Courses:** MIm 451, 455; 552, and 553; two hours of MIm 595; BChe 460.

**Electives:** At least 3 semester hours must be in 500-level didactic courses in the department (not including MIm 552 and 553).

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Thesis required. 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.

#### **Coursework**

**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 fifty-two semester hours of MIm 599.

**Electives:** At least 2 semester hours must be in 500-level didactic courses in the department (not including MIm 552 and 553) 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 552 and 553); 3 semester hours of collateral 500-level courses; 6 semester hours of MIm 595; and 59 semester hours of MIm 599.

## Pathology

*Mailing Address: Department of Pathology, 1819 W. Polk, M/C 847, Chicago, IL 60612-7335*

*Campus Location: 437 CMW*

*Curriculum Code: 5039*

*Telephone: (312) 996-2954*

*Head of the Department: Jose Manaligod*

*Director of Graduate Studies: Rameshwar Prasad*

The Department of Pathology offers work leading to degrees in Pathology at both the master's and doctoral levels. An interdepartmental specialization in neuroscience is available to doctoral students in this program. In addition, a combined MD/PhD degree program is available for medical students.

### Admission Requirements

Students are accepted on a competitive 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 through organic chemistry, as well as introductory and advanced courses in mathematics and biology. Histology, human anatomy, and physiology are prerequisites for graduate courses in pathology.

*Grade Point Average:* At least 4.00 (A=5.00).

*Tests Required:* GRE general; verbal and quantitative scores should be at least 500 each.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* 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.

#### Coursework

*Required Courses:* Path 425, 426, and 501; and GC 470. Students must register in Path 595 each semester.

#### Comprehensive Examination

None.

#### Thesis or Project

Thesis required.

Doctor of Philosophy

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

#### Coursework

At least 12 semester hours must be in formal 500-level courses, including 6 hours in courses offered by the department and 6 hours in courses from outside the major.

*Required Courses:* Path 425, 426, and 501; GC 470; Bche 460; MIm 451 or 452; and NuMS 545. Students must

register in Path 595 each semester.

#### Examinations

*Preliminary Examination:* Required.

#### Dissertation

Required.

#### Interdepartmental Specialization in Neuroscience

In addition to meeting the above requirements, student 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.

## Pharmacology

*Mailing Address: Department of Pharmacology, 835 S. Wolcott, M/C 868, Chicago, IL 60612-7343*

*Campus Location: E-403 MSB*

*Curriculum Code: 6538*

*Telephone: (312) 996-7635*

*Email: rdgreen@uic.edu*

*Head of the Department: Asrar B. Malik*

*Director of Graduate Studies: R. D. Green*

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 available to doctoral students in this program. The department is particularly strong in neuropharmacology, cardiovascular pharmacology, and drug metabolism/toxicology. 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. Applicants should have a thorough knowledge of chemistry and physiology; depending on the area of research, competency in microbiology, immunology, anatomy, or pathology may also be required.

*Grade Point Average:* At least 3.75 (A=5.00).

*Tests Required:* GRE general. Applicants must have a combined verbal and quantitative GRE score of at least 1100.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Required.

*Personal Statement:* Not required.

#### Nondegree Applicants

Nondegree applicants must show adequate preparation to enroll in desired courses and must obtain the permission of the director of graduate studies.

### Degree Requirements

Master of Science

**Minimum Semester Hours Required:** 32.

#### Coursework

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 or Project

Thesis 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.

Doctor of Philosophy

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

### **Coursework**

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, 835 S. Wolcott, M/C 901, Chicago, IL 60612-7342

**Campus Location:** E202 MSB

**Curriculum Code:** 7538

**Telephone:** (312) 996-7620

**Email:** lrich@uic.edu

**Head of the Department:** R. John Solaro

**Director of Graduate Studies:** Mrinalini C. Rao

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 4.00 (A=5.00).

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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.

### **Coursework**

**Required Courses:** PhyB 401, 402, 569, 592, 595, and 598; 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 or Project**

Thesis required.

### **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.

### **Coursework**

**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 mid-thesis 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, 840 S. Wood,  
M/C 958, Chicago, IL 60612-7322*

*Campus Location: 518 CSB*

*Curriculum Code: 9039*

*Telephone: (312) 996-6765*

*Email: WRLaw@uic.edu*

*Head of the Department: Herand Abcarian*

*Director of Graduate Studies: William Law*

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=5.00) 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.

*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.

#### Coursework

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 or Project

Required.

## Nursing Science

*Mailing Address: College of Nursing, 845 S. Damen, M/C 802, Chicago, IL 60612-7350*

*Campus Location: 138 NURS*

*Curriculum Codes: 1034 (Med/Surg), 1134 (Psychiatric), 1234 (Public Health), 1334 (Maternal-Child), 1534 (Administration), 9034 (PhD)*

*Telephone: (312) 996-5784*

*Email: leahb@uic.edu*

*Dean of the College: Joan Shaver*

*Director of Graduate Studies: Kathleen Knafl*

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; psychiatric; and public health nursing. An interdepartmental concentration in 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. The College of Nursing is fully accredited by the National League for Nursing and the American Association of Colleges of Nursing.

### 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 NLN or AACN 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 coursework may be required in some specializations. Consult the College of Nursing's Graduate Manual.

**Grade Point Average:** At least 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

**Tests Required:** GRE general. Applicants to the MBA/MS joint degree program may substitute the GMAT.

**Minimum TOEFL Score:** 550.

**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 non-nursing 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.

**Doctor of Philosophy**

**Prior Degrees:** A master's degree in nursing from an NLN or AACN 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 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

**Tests Required:** GRE general.

**Minimum TOEFL Score:** 550.

**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; Maternal-Child, Pediatric and Perinatal Clinical Specialists, 39-41; Maternal-Child, Nurse Midwifery, 58-60; Maternal-Child, Women's Health Care Nurse Practitioner, 56-58; Medical-Surgical, all Clinical Nurse Specialists, 40-42; all Practitioners, 48-50; Psychiatric, 42-44; Public Health, Community, 37-39; Family Nurse Practitioner, 51-53; Home Health, 38-40; Occupational Health and School Specialists, 40-42, Occupational Health and School Nurse Practitioners, 62-64.

### Coursework

**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.

**Maternal-Child Nursing (Pediatric Clinical Nurse Specialist)**—NuSc 530, 531, and 532; NuMC 510, 515, 516, 520, and 521.

**Maternal-Child Nursing (Perinatal Clinical Nurse Specialist)**—NuSc 531 and 532; NuMC 507, 508, 515, 516, 520, and 521.

**Maternal-Child Nursing (Nurse Midwifery)**—NuSc 531, 532; NuMC 507, 508, 515, 517, 518, 525, 526, 527, and 528.

**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.

**Maternal-Child Nursing (Pediatric Nurse Practitioner)**—

NuSc 530, 531, 532 and 533; NuMC 510, 511, 512, 513, 514, and 515.

Medical-Surgical Nursing (all Clinical Nurse Specialists) —NuSc 530, 531, 532, 533; NuMs 530, 532, 533, and 535.

Medical-Surgical Nursing (all Nurse Practitioners) —NuSc 530, 531, 532, 533; NuMs 530, 532, 534, 536, and 538.

Psychiatric Nursing (Adult Psychiatric Nursing)—NuSc 531, 532, and 533; NuPS 400, 500, 503, 505, 521, and 522.

Psychiatric Nursing (Child/Adolescent Psychiatric Nursing)—NuSc 531, 532, and 533; NuPS 400, 502, 503, 504, 521 and 522.

Public Health (Community Nurse Specialist)—NuPH 515, 516, 517, 518; EOHS 400; EPID 400.

Public Health (Family Nurse Practitioner)—NuSc 530, 531, and 532; NuPH 500, 515, 516, 524, 525, 528; EPID 400.

Public Health (Home Health Care Specialist)—NuPH 515, 516, 517, 518, 526; EOHS 400; EPID 400.

Public Health (Occupational Health Nurse Practitioner)—NuSc 530, 531, 532; NuPH 400, 500, 515, 516, 524, 525, 529; EOHS 421, 482, 551, 558; EPID 400.

Public Health (Occupational Health Nurse Specialist)—NuPH 400, 515, 516, 517, 518, 529; EPID 400; EOHS 421, 482, 551, and 558.

Public Health (School Nurse Specialist)—NuPH 402, 420, 515, 516, 517, 518; EPID 400; EOHS 400.

Public Health (School Nurse Practitioner)—NuSc 530, 531, 532; NuPH 402, 420, 500, 515, 516, 517, 518, 524, 525; EPID 400; EOHS 400.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Required. Thesis students must earn 5 hours in NuSc 598; students who elect the project option must earn 3 hours in NuSc 597.

MS/MBA

**Minimum Semester Hours Required:** 65-67.

#### **Coursework**

*Required Core Courses:* NuSc 527, 528, 529, and 597 or 598.

*Specialization Courses:* NuAS 515, 516, 517, 518; Actg 500; Econ 520, 521; Fin 500; IDS 531, 532; Mgmt 541, 590; Mktg 500; EPID 400.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Required. Thesis students must earn 5 hours in NuSc 598; students who elect the project option must earn 3 hours in NuSc 597.

MS/MPH

**Minimum Semester Hours Required:** 58-66

#### **Coursework**

*Required Core Courses:* Bstt 400; NuSc 526, 527, 528, 529, and 597 or 598.

*Specialization Courses:* NuPH 515, 516, 517, 518; IPHS 401, 650; EOHS 400; CHSc 400, 432, 480, 494; EPID 400.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Required. Thesis students must earn 5 hours in NuSc 598; students who elect the project option must earn 3 hours in NuSc 597.

Doctor of Philosophy

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

#### **Coursework**

*Required Courses:* NuSc 505, 506, 511, 515, and 6 hours of statistics.

*Electives:* At least 14 hours must be in 500-level didactic courses, of which at least 7 hours must be in nursing courses, and at least 4 hours must be in non-nursing courses.

#### **Dissertation**

Required. Students must earn at least 31 hours in NuSc 599.

#### **Examinations**

*Preliminary examination:* Required.

#### **Interdepartmental Concentration in Women's Studies**

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.



## Criminalistics

(see Forensic Science)

## Forensic Science

*Mailing Address: Forensic Science Program, 833 S. Wood, M/C 866, Chicago, IL 60612-7231*

*Campus Location: 412C Pharm*

*Curriculum Code: 8535*

*Telephone: (312) 996-2250*

*Email: reg@uic.edu*

*Head of the Program and Director of Graduate Studies: R.E. Gaensslen*

The masters program in forensic science is administered by the Department of Pharmaceutics and Pharmacodynamics, 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 recommended electives.

### Admissions Requirements

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

*Baccalaureate Field:* B.S. 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 4.00/5.00 overall. Applications strengthened by 4.25/5.00 overall, and 4.00/5.00 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.

*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:** 38.

#### Coursework

*Required Courses:* PmPd 480, 580, 581, 582, 583, 584.

*Electives:* 9-12 semester hours depending upon student's area of specialty interest, chosen from a list of electives available in the department; may include 2-4 hours of PmPd 592, Internship in Forensic Sciences, for those without equivalent work experience.

#### Comprehensive Examination

Required for students choosing to fulfill the research requirement with PmPd 597.

#### Thesis or Project

Thesis or project required. Thesis students must earn at least 6 hours in PmPd 598; Project students must earn 3 hours in PmPd 597. Those electing the project option must also take a Comprehensive Exam.

## Medicinal Chemistry

*Mailing Address: Department of Medicinal Chemistry and Pharmacognosy, 833 S. Wood, M/C 781, Chicago, IL 60612-7231*

*Campus Location: 539 Pharm*

*Curriculum Code: 1035*

*Telephone: (312) 996-7245*

*Fax: (312) 996-7107*

*Email: fitzloff@uic.edu*

*Internet: www.uic.edu/~cordell*

*Head of the Department: Geoffrey A. Cordell*

*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 the application of scientific principles to the design, synthesis, structure elucidation, and analysis of synthetic compounds possessing biological activity. The department also offers a graduate program in Pharmacognosy; consult the appropriate heading 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:* Pharmacy, chemistry, biology, or a related science. Prior academic work must include at least 36 semester hours of chemistry, including general, analytical, organic, physical (one year), and biological (one semester) chemistry, and a course in physics.

*Grade Point Average:* At least 4.00 (A=5.00) for the final 60 semester (90 quarter) hours of baccalaureate study.

*Tests Required:* GRE general. The GRE advanced chemistry test is recommended.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required.

*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:** 32.

#### Coursework

*Required Courses:* MdCh 460, 561, 562, 564, 571, 572, 594, and 595.

#### Comprehensive Examination

Required. (Given following completion of the second semester of required coursework.)

#### Thesis or Project

Thesis and oral thesis defense required.

Doctor of Philosophy

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

#### Coursework

At least 21 semester hours must be in didactic courses.

*Required Courses:* MdCh 460, 561, 562, 564, 571, 572, 594, two hours of MdCh 595, and at least three hours of a 500-level course with a significant laboratory component.

#### Examinations

*Departmental Qualifying Examination:* Required; passing this examination permits doctoral students to bypass the formal requirement of writing a master's thesis. (Given following completion of the second semester of required coursework).

*Preliminary Examination:* Required; oral.

### **Dissertation**

Required, including oral defense.

### **Other Requirements**

Students must demonstrate proficiency in an approved computer or foreign language.

All candidates must assist in teaching one or more of the courses offered by the College of Pharmacy or the department; duties include preparing for and conducting didactic and laboratory instruction.

### **Fellowships**

In addition to University-wide competitive fellowships, the Medicinal Chemistry program offers annually a program-specific competitive fellowship, the Ludwig Bauer Fellowship in Medicinal Chemistry (sponsored by Warner-Lambert Parke-Davis), with a \$15,000 stipend per annum.

## **Pharmacognosy**

*Mailing Address: Pharmacognosy Program, 833 S. Wood, M/C 877, Chicago, IL 60612-7231*

*Campus Location: 331 Pharm*

*Curriculum Code: 6035*

*Telephone: (312) 996-7253*

*Email: hfong@uic.edu*

*Director of the Program: Norman R. Farnsworth*

*Director of Graduate Studies: Harry H.S. Fong*

The Department of Medicinal Chemistry and Pharmacognosy offers work 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.

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=5.00) for the final 60 semester (90 quarter) hours of undergraduate study.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 550.

*Letters of Recommendation:* Three required.

*Personal Statement:* Required.

*Other Requirements:* PhD applicants 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.

#### **Coursework**

At least 16 hours must be in didactic courses.

*Required Courses:* PmPg 480, 510, 511, and 595.

#### **Comprehensive Examination**

None.

#### **Thesis or Project**

Thesis required.

#### **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.

#### **Coursework**

At least 26 semester hours must be in didactic courses.

*Required Courses:* PmPg 480, 510, 511, 521, 569; and two hours of PmPg 595.

*Electives:* Vary by student's area of research interest; MdCh 460 and 562 are recommended. At least 4 hours must be in 500-level courses outside the program.

#### **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, 833 S. Wood, M/C 871, Chicago, IL 60612-7231*

*Campus Location: 310 Pharm*

*Curriculum Code: 7035*

*Telephone: (312) 996-0888*

*Email: lambertb@uic.edu or schlemm@uic.edu or hayat@uic.edu*

*Director of Graduate Studies: Win L. Chiou*

*Program Coordinators: Hayat Alkan-Onyuksel (Pharmaceutics), Bruce Lambert (Pharmacy Administration), R. Francis Schlemmer (Pharmacodynamics)*

The College of Pharmacy offers work leading to degrees in Pharmacy at both the master's and doctoral levels. Coursework 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 4.00 (A=5.00) in work for the first academic degree..

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600.

*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:* Pharmaceutics and pharmacodynamics do 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 hours; pharmaceutics - 39 hours.

#### **Coursework**

*Required Core Courses:*

Pharmacy Administration - Mgmt 541, HPA 463, Soc

500, EPsy 503, PmAd 507, 510, 595.

Pharmaceutics - PmPc 495, 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 or Project***

Thesis required. Pharmacy administration students must earn 6 hours in PmAd 598; pharmaceutics students must earn at least 10 hours in PmPc 598.

Doctor of Philosophy

***Minimum Semester Hours Required:*** 96 from the baccalaureate, 64 from the master's.

***Coursework***

At least 20 hours must be in 500-level didactic courses.

***Required Core Courses:***

Pharmacy Administration - Soc 500; Psch 443, 543, 545; HPA 463; PmAd 482, 500, 507, 510, 516, 525, 535, 571, 595, and one PmAd elective.

Pharmaceutics - PmPc 495, 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 - PhyB 401, 402; Bche 460; GC 470, 471; Bstt 500; Phar 400; PmPd 420, 421, 500, 501, 542.

***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.

## Public Health Sciences

*Mailing Address: School of Public Health, 2121 W. Taylor, M/C 922, Chicago, IL 60612-7260*

*Campus Location: 116 SPHW*

*Curriculum Code: 5037*

*Telephone: (312) 996-6620*

*Email: 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 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 *Prospectus* 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 4.00 (A=5.00).

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

*Minimum TOEFL Score:* 550.

*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:* 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.

MS Nursing/MPH

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 *Prospectus* for information on the admission requirements of the MPH program. Joint degree students must take their MPH training in community health sciences.

### 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 area.

Biostatistics—32; all other areas—48.

### Coursework

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 or Project

Thesis required for all areas except biostatistics. Thesis students must earn at least 16 hours in IPHS 598.

### Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

MS Nursing/MPH

**Minimum Semester Hours Required:** 54 to 58.

### Coursework\*

*Required Courses:* Bstt 400; Epid 400; NuSc 500, 504, and 597 or 598; NuPH 520 and 521; EOHS 400; CHSc 400; HPA 400; IPHS 401 and 650 (Field Experience in Public Health).

*Electives:* An additional 6 hours in NuPH courses, and an additional 11 to 13 hours in public health courses must be taken.

\* This program is undergoing revisions. Consult the School of Public Health and College of Nursing for updated coursework requirements.

### Comprehensive Examination

None.

### Thesis or Project

Required. Thesis students must take 5 hours of NuSc 598; students completing a project must take 3 hours of NuSc 597. The School of Public Health advisor must be a committee member for the nursing research project.

### 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.

### Coursework

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, 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 Women's Studies***

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Social Work

*Mailing Address: Jane Addams College of Social Work,  
1040 W. Harrison, M/C 309, Chicago, IL 60607-7134*

*Campus Location: 4022 ECSW*

*Curriculum Code: 4726*

*Telephone: (312) 996-4629*

*Email: hasej@uic.edu*

*Dean of the Jane Addams College of Social Work: Creasie  
Finney Hairston*

*Director of Graduate Studies: Dee Morgan Kilpatrick*

The Jane Addams College of Social Work offers work leading to the Doctor of Philosophy in Social Work. An interdepartmental concentration in 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 4.00 (A=5.00) on the final 60 semester (90 quarter) hours of undergraduate study and for all work beyond the baccalaureate.

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

*Minimum TOEFL Score:* 580.

*Letters of Recommendation:* Required; number varies according to applicant's background. 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 and their long range career goals.

*Other Requirements:* Applications must be submitted directly to the Jane Addams College of Social Work. Admissions are restricted to the fall semester.

## 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:** 96 from the baccalaureate.

## Coursework

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 590, 591, 592, 593, and 594.

*Electives:* At least 18 hours must be in courses outside of the Jane Addams College of Social Work. Three hours of the outside credit must be in an advanced statistics course supportive of the dissertation research. At least half of the outside credit should be in one discipline.

## Examinations

*Preliminary examination:* Required.

## Dissertation

Required.

## Interdepartmental Concentration in Women's Studies

A student earning a graduate degree in this department may enroll for a Graduate Concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## Public Administration

*Mailing Address: Public Administration Program, 412 S. Peoria, M/C 278, Chicago, IL 60607-7064*

*Campus Location: 130 ALHS*

*Curriculum Code: 5176*

*Telephone: (312) 996-3109*

*Email: pietka@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 coursework 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 4.00 (A=5.00) 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.

*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 coursework as prescribed by the program director. Such coursework will not apply to the degree requirements.

*Grade Point Average:* At least 4.00 (A=5.00) in all undergraduate coursework and 4.25 in all post-baccalaureate coursework.

*Tests Required:* GRE general.

*Minimum TOEFL Score:* 600.

*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.

#### Coursework

*Required Courses:* PA 420, 425, 429, 439, 506, 507, 511, 530, 536, 537, and 538.

#### Comprehensive Examination

None.

#### Thesis or Project

None.

#### Other Requirements

Full-time students participate in supervised internships with public service agencies; part-time students employed in the 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.

#### Coursework

A cumulative grade point average of at least 4.00 (A=5.00) 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 coursework, 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 seventy-five 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 coursework. 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. Up to 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, 412 S. Peoria, M/C 348, Chicago, IL 60607-7137*

*Campus Location: 215 ALHS*

*Curriculum Codes: 2276 (MUPP), 3126UP (PPA PhD)*

*Telephone: (312) 996-5240*

*Email: upp@uic.edu*

*Director of Graduate Studies: Curtis R. Winkle*

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 in Public Policy Analysis with a specialization in urban planning. 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 4.00 (A=5.00) 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.

*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 in Public Policy Analysis

*Prior Degrees:* Applicants must have a master's degree.

*Grade Point Average:* At least 4.00 (A=5.00) 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.

*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.

### **Coursework**

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 or Project***

Required. No more than 16 hours of UPP 598 or 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 of 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.

***Coursework***

*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 Women's Studies***

A student earning a graduate degree in this department may enroll for a graduate concentration in Women's Studies. The requirements for this concentration are application to the Women's Studies Graduate Director; approval by a Women's Studies graduate faculty member, preferably within the department of the degree, who becomes the student's Women's Studies advisor; and a total of 16 hours of graduate course work, including WS 501 and WS 502, plus eight additional hours of 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 Women's Studies advisor. Students pursuing this concentration must consult the Women's Studies Graduate Director.

## 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.
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.
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.
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.
494. Special Topics in Accounting. 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. Prerequisite: Approval of the department.
500. Introduction to Financial and Managerial Accounting. 4 Hours. Credit is not given for Actg 500 if the student has credit in MBA 501. Concepts and principles of financial accounting for preparation of external reports. Cost concepts and analysis for managerial accounting planning and control. Prerequisite: Admission to the MBA or the MS 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. Efficient capital markets as a framework for evaluating accounting theories and disclosure policies; measures of the firm's economic performance and financial position; other contemporary issues. Prerequisite: Actg 515.
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. Managerial Accounting Theory. 4 Hours. Formal models of management accounting issues; concepts of information; cost assessment; cost allocation; models of incentive contracting, and integration of behavioral science and management accounting. Prerequisites: Actg 506 and IDS 531.
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.
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. Intended to serve as an integrative capstone to a professional accounting degree program. Instruction in research methods, issues, and research appreciation and evaluation together with individual practice in planning, conducting, and reporting professional research projects in accounting. Prerequisite: Actg 515.
594. Special Topics in Accounting—Graduate. 4 Hours. Topics rotate in the various areas of accounting, including but

## Accounting (Actg)

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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. Ph.D. 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)

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510. Management of Health and Nursing Services. 4 Hours. Advanced concepts of nursing management and leadership in health policy, ethics, and economics for delivery of nursing and health services. Prerequisite: Consent of the instructor.

511. Health and Nursing Finance. 2 Hours. The financial environments for health and nursing are examined; financial statements are analyzed as are nursing costs and costing techniques. Prerequisite: NuAS 510 or consent of the instructor.

512. Economics of Health and Nursing. 2 Hours. Analysis of descriptive, explanatory, and evaluative economics for health and nursing, addressing output, demand for care, supply behavior, and health policy. Prerequisite: NuAS 510 or consent of the instructor.

513. Advanced Management of Health and Nursing Services. 3 Hours. Analysis and evaluation of nursing services, including their context, management, and outcomes. Emphasis on quality measurement, health policy, and ethics with a macroanalytic view of healthcare. Prerequisites: NuAS 511 and 512.

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.

520. Practicum: Nursing Management. 4 Hours. Students observe, participate in and evaluate the context, management, and outcomes of nursing services guided by individual nurse preceptors in selected health care settings. Prerequisites: Credit or concurrent registration in NuAS 513, and Mgmt 541 or HPA 511, or consent of the instructor.

533. Nursing Management Within Primary Health Care. 2 Hours. Organization, management, and financing of primary health care, including policy, legal, and ethical dimensions. Prerequisite: NuSc 528 and consent of the instructor.

534. 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.

542. Issues in Nursing Education Administration I. 3 Hours. Focuses on the larger context of education in the United States, changing paradigms of education, leadership in nursing education, and internal administration of a college of nursing. Prerequisite: Consent of the instructor. Credit in NuAS 531 and 532 is highly recommended.

543. 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 NuAS 542 is highly recommended.

545. Power and Authority in Nursing Systems. 2 Hours. Examines the nature of power, influence and authority in nursing and health systems nationally and internationally. Prerequisite: Consent of the instructor.

547. Preceptorial in Nursing Education Administration. 8 Hours. Opportunity to work with senior executives in nursing education, continuing education, or in professional organizations concerned with nursing education. Prerequisite: NuAS 543.

550. Issues for Research and Practice in Women's Health. 3 Hours. Same as 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)

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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.

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)

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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. 3 Hours. Functional and structural anatomy and embryology of the body. Prerequisites: 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 B.S. in Physical Therapy program or M.A.M.S. 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.

512. Structure and Function of Cell Components. 3 Hours. Lecture and seminar course in cell biology, emphasizing the structural basis of cellular function. Prerequisite: Anat 442.

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. 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.

534. Developmental Immunobiology. 2 Hours. The relationship of immunology to problems of development in terms of the capacity of the embryo, fetus, or neonatal animal to respond immunologically to antigenic stimulation; immunological methods as tools for the study of antigenic determinants in the developing embryo. Prerequisites: Anat 442 and MIm 502.

538. Mammalian Feeding Mechanisms. 3 Hours. Survey of oral adaptations in mammals; evolution and functional morphology of teeth, masticatory muscles, and jaw mechanics. Prerequisite: Human gross anatomy or comparative anatomy.

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.

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.

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.

## Anthropology (Anth)

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.

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.

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.

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 LAsT 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 LAsT 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.

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.

## Anthropology (Anth)

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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.

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.

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. Ph.D. 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 Ph.D. in Anthropology.



## Architecture (Arch)

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401. Advanced Architecture I Lecture. 3 Hours. Comprehensive architectural problem solving with an emphasis on one of the two concentration options: design or building science. Focus of each option would include interior space for design or building systems for building science. Prerequisite: Completion of the second plateau course work.

402. Advanced Architecture I Laboratory. 6 Hours. Laboratory case study component to Arch 401. Prerequisite: Completion of the second plateau course work.

403. Advanced Architecture II Lecture. 3 Hours. Comprehensive architectural problem solving with emphasis on one of two concentration options: design or building science. Focus of each option would include exterior space and landscape for design or fabrication and energy topics for building science. Prerequisite: Completion of the second plateau course work.

404. Advanced Architecture II Laboratory. 6 Hours. Laboratory case study component of Arch 403. Prerequisite: Completion of the second plateau course work.

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 M.Arch. 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 M.Arch. Program.

412. Women and the Environment. 4 Hours. Same as WS 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.

421. Advanced Structural Analysis I: Structures Option. 3 Hours. Advanced technique of structural analysis applied to building frames. Stiffness-displacement method of analysis; computer applications of problem-oriented languages such as STRESS and STRUDL; influence lines, moving loads, criteria for maxima. Prerequisites: Arch 222 and completion of the second plateau coursework.

422. Advanced Structural Design I Laboratory. 6 Hours. Advanced techniques in the structural design of reinforced concrete structures: columns subjected to biaxial bending, two-way edge and column supported slabs; torsion analysis; yield line theory for slabs; prestressed concrete. Prerequisites: Arch 222 and completion of the second plateau coursework.

423. Advanced Structural Analysis II: Structures Option. 3 Hours. Advanced techniques of structural analysis applied to long span building structures, such as plates, shells, arches, and domes. Building dynamics. Wind and earthquake effects on buildings. Prerequisite: Arch 421.

424. Advanced Structural Design II. 6 Hours. Selected advanced topics in the design of steel and masonry building components and systems. Steel: composite design; plastic design; LFRD design;

special connections. Masonry: lateral-load resisting elements; high-rise masonry; connections and joints. Prerequisite: Arch 422.

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 M.Arch. 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 M.Arch. 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 small and medium scale buildings with emphasis on site, context, zoning, building code, user needs, technology and aesthetic factors. Prerequisites: Arch 452, 462, and 471 or graduate standing in the M.Arch. Option II program.

454. Architectural Design II. 6 Hours. Design of buildings in an urban context, site as design determinant, analysis and theory of urban fabric and infrastructure and their influence on architectural form. Prerequisites: Arch 453, 463, 472 and 410, or graduate standing in the M.Arch. Option II program.

459. Introduction to Building Science I. 4 Hours. Introduction to building science through materials and systems of construction, forces that act on buildings, human comfort, construction and technology of low-rise residential building types. Prerequisite: Consent of the School.

460. Introduction to Building Science II. 4 Hours. Introduction to construction and technology of low-rise commercial and industrial building types, analysis of structural and environmental control systems, methods and types of construction materials. Prerequisite: Arch 459 or consent of the school.

461. Building Science I. 4 Hours. Introduction to building materials and systems of construction, forces that act on buildings, human comfort criteria, construction and technology of low-rise residential building types. Prerequisite: Graduate standing in the M.Arch. Program.

462. Building Science II. 4 Hours. Construction and technology of low-rise commercial and industrial building types, analysis and application of appropriate structural and environmental control systems, construction methods and building materials. Prerequisite: Arch 461.

463. Building Science III. 4 Hours. Construction and technology of high-rise residential and commercial building types,

## Architecture (Arch)

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analysis and application of structural and environmental control systems, construction methods and building materials. Prerequisite: Arch 462.

464. Building Science IV. 4 Hours Construction and technology of long-span and special use building types, analysis and application of appropriate structural and environmental control systems, construction methods and building materials. Prerequisite: Arch 463.

470. Structures I. 4 Hours. Statics and an introduction to the nature of structural materials and to the theoretical nature of architectural structures. Prerequisite: Approval of the School.

471. Structures II. 4 Hours. Introduction to the strength of materials; torsion, bending and shear; combined loading; deflection; failure and safety; shear and moment diagrams, and application of these principles. Prerequisite: Approval of the School.

472. Architectural Structures I. 4 Hours. Strength of materials; stress and strain; torsion, bending and shear in beams; combined loading; deflection of beams; failure and safety of buildings; shear and moment diagrams and application of these principles to masonry construction. Prerequisites: Arch 470 and graduate standing in the M.Arch. Program.

473. Architectural Structures II. 4 Hours. Design of structural steel and wood building elements including tension members, compression members, beams, bearing plates, bolted connections, and welded connections. Prerequisites: Arch 472 and graduate standing in the M.Arch. Program.

474. Architectural Structures III. 4 Hours. Design of reinforced concrete building elements including beams, slabs, columns, anchorages, splices and foundations. Prerequisites: Arch 473 and graduate standing in the M.Arch. 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 M.Arch. 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 M.Arch. Program.

485. Development of Urban Form and Structure. 4 Hours. The formal structure of the city considering space, place, image and the physical and social factors that have influenced urban form. Prerequisite: Graduate standing in the M.Arch. Program.

491. Architectural Study in Europe. 0-17 Hours. May be repeated for a maximum of 34 hours of credit. Lectures, seminars, studio and independent travel/study in Europe. Architectural design, planning, structures, history and technology. Prerequisites: Completion of at least one year of architectural graduate course work, 4.00 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 M.Arch. 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.

551. Advanced Architectural Design I. 8 Hours. Design of complex building types with emphasis on technical legal and economic considerations. Prerequisites: Arch 454, 464, and 473.

552. Advanced Architectural Design II. 12 Hours. An appropriately scaled, comprehensive problem requiring definitive solu-

tions to design, site planning, detail, interior space, structural and mechanical systems and materials. Additional emphasis on aesthetics and the importance of metaphor in building design. Prerequisites: Arch 551 and 474.

554. Advanced Architectural Design III. 8 Hours. Multiple architecture design problems with emphasis on the application of current architectural theory. Prerequisite: Graduate standing in the M.Arch. Program.

555. Advanced Architectural Design IV. 8 Hours. Single case study architectural design emphasizing application of current architectural theory. Prerequisite: Arch 554 or consent of the director of graduate studies.

596. Independent Study for Graduate Students. 1 to 4 Hours. Students may register for more than one section per term. May be repeated for a maximum of 16 hours of credit. Individual study. Prerequisite: Approval of the school.

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. 1-16 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.

416. Computer Graphics I. 5 Hours. Computer graphics for graphic design. Images generated on computer displays, plotters, and other output devices. Computer technology integrated with graphic design practice. Prerequisites: AD 205 or consent of the instructor.

417. Computer Graphics II. 5 Hours. Computer typography and page layout. Computer-aided design and production for print. Prerequisite: AD 416 or consent of the instructor.

419. Typography III. 5 Hours. Advanced experimental typography. 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. Industrial Design Research Methods. 5 Hours. Application of the principles of problem-solving and industrial

design research methodology to the development of a faculty approved senior or graduate project. Prerequisites: Completion of 8 hours of AD 320 and 321 or the equivalent and approval of the school.

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. Computer-Aided Industrial Design II. 5 Hours. 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 or consent of the instructor.

432. Painting III. 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 8 hours of printmaking and AD 391.

442. Sculpture III. 5 Hours. May be repeated for a maximum of 15 hours of credit. Independent projects under 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 391, and 8 hours of printmaking.

451. Advanced Printmaking. 5 Hours. May be repeated for a maximum of 15 hours of credit. Expansion of printmaking techniques and processes emphasizing experimentation and innovation; in-depth study developing personal, creative, visual language. Prerequisites: 12 hours of printmaking, including AD 252 and two different courses selected from AD 251, AD 253, or AD 254 and AD 231 and AD 241 and AD 391.

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

## Art and Design (AD)

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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.

485. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

488. Computer Graphics I. 4 Hours. Same as EECS 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 EECS 370.

492. Studio Seminar III. 4 Hours. A critical and rigorous examination of the major trends in twentieth century art; attention to underlying or causal social and cultural patterns. Prerequisites: AD 231, 241, 391, two printmaking courses, and concurrent registration in AD 432, 442 or 451.

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 4.00 and approval of the school.

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 and studio 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 consultive agreement with graduate faculty committee. Prerequisites: 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 consultive 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 consultive 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 consultive 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 consultive 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 consultive 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 consultive 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 consultive 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 M.A. 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 M.A. 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 M.A. 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 M.A. 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



## Art and Design (AD)

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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 consultative 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 consultative 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. Multi-Cultural 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 EECS 588. State of the art in computer graphics and interactive techniques: Three-dimensional surface and volumetric models. A laboratory is required. Prerequisite: EECS 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 and Architecture. 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.

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. 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. 0-12 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.

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

## Art History (AH)

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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.

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.

## Associated Health Sciences (AHS)

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420. Pathophysiology. 3 Hours. Same as PT 420. Introduction to medical management of disease processes. Fundamental pathologic processes in human diseases. Prerequisites: Anat 440 and PhyB 341 or the equivalents.

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.

564. Community Integration in Developmental Disabilities. 2 Hours. Same as CHSc 564. Origins of residential institutions for disabled persons in the U.S.; demographics; relevant legislation and court cases; and future directions.

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)

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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.

495. Biochemical Literature Review. 2 Hours. S/U grade only. Introductory seminar in which classic papers in biochemistry and molecular biology will be discussed. Prerequisite: Consent of the department.

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. 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. Prerequisites: 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.

594. Special Topics in Biochemistry. 1-3 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. S/U grade only. Student and faculty presentation of research subjects of current importance in biochemistry and related fields, based on current research literature. Prerequisite: Bche 495.

596. Independent Study in Biochemistry. 1-3 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 M.S. candidate under the direction of a faculty member leading to the M.S. in Biochemistry. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent investigation carried out by Ph.D. candidate under the supervision of a faculty member leading to the Ph.D. in Biochemistry. Prerequisite: Consent of the instructor.

## Bioengineering (Bioe)

407. Pattern Recognition I. 4 Hours. Same as EECS 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: EECS 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: EECS 310 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.
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: EECS 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: EECS 310.
450. Artificial Organs. 4 Hours. The underlying engineering concepts involved in the development, testing, and application of artificial organs. Prerequisites: EECS 310; and ChE 311 or ME 211; and BioS 442 or 443.
451. Artificial Organs Laboratory. 1 Hour. Laboratory experiments with implantable and extra-corporeal artificial organs. Prerequisite: Credit or concurrent registration in Bioe 450.
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: EECS 310 and either BioS 442 or 443.
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.
475. 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: EECS 310 and either BioS 442 or 443.
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.
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.
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.
560. Processing and Properties of Structural Biomaterials. 4 Hours. Considers the inter-relationships 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.
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 M.S. thesis project.
599. Ph.D. Thesis Research. 0 to 16 Hours. Students may register for more than one section per term. S/U grade only. Research in Ph.D. 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 the approval of the department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.
403. **Educational Practice with Seminar II.** 6 Hours. Graduate credit only with the approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.
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.
420. **Developmental Biology.** 3 Hours. Principles governing growth and differentiation from the molecular to the organismic level. Prerequisite: BioS 220.
421. **Developmental Biology Laboratory.** 2 Hours. Animals used in instruction. Laboratory problems in developmental biology. Prerequisite: Credit or concurrent registration in BioS 420.
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 non-symbiotic 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.
433. **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.
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.
437. **Biogeography.** 3 Hours. Geological/paleontological factors leading to past and present distribution patterns of plants and animals; experimental studies of origin and diversification of island and continental biotas. Lecture. Prerequisites: BioS 100 and 101, or 110, or the equivalent.
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. Prerequisite: 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.
467. Theory and Practice of Botanical Systematics. 3 Hours. Theoretical basis for modern taxonomic practices among higher plants, emphasizing the conceptual framework for problem solving, the types of data used, and methods of data analysis. Prerequisite: BioS 220 or 233 or 263 or 364 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.
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.
492. Quantitative Biology I. 3 Hours. Quantitative ideas and mathematical models in biological theory and experimentation. Prerequisites: Math 180 and BioS 220.
493. Quantitative Biology II. 3 Hours. Design and conduct of biological experiments and interpretation of biological data. Prerequisite: BioS 492.
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. 4 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. 4 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.
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.
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 presen-



## Biological Sciences (BioS)

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tations, 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. 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. S/U grade only. 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 M.S. project or M.S./Ph.D. 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 Ph.D. thesis. Prerequisite: Consent of the instructor.

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Biomedical and Health Information Sciences (BHIS)

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400. Computers in Health Care I. 3 Hours. Introduction to information technology and systems in a health care setting; collection, analysis and management of health care data; storage, retrieval, and networking; system security. Laboratory practice. Prerequisite: IDS 100 or the equivalent.

401. Computers in Health Care II. 3 Hours. Advanced topics in information technology and systems in a healthcare setting; system design, evaluation and selection; web site design and programming. Prerequisite: BHIS 400.

437. Health Care Data. 3 Hours. 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.

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.

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: Credit or concurrent registration in IDS 531 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 Information Management. 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 one other course from among BHIS 515, 520, or 530; or consent of the instructor.

530. Topics in Health Information Management. 4 Hours. Same as HPA 550. The study of advanced topics in various areas of health information management. Prerequisites: BHIS 510, and one course from among BHIS 515, 520, or 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.

596. Independent Study. 1-4 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.

## Biomedical Visualization (BVis)

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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, multi-component 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.

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.

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. Prerequisites: Bstt 400 or the equivalent and consent of the instructor.

420. Mathematical Methods in Biostatistics. 2 Hours. Vector and matrix algebra useful in statistics, including determinants, inverses, generalized inverses, eigenvalues and eigenvectors; orthogonal polynomials, Newton-Raphson methods, infinite series and convergence. Prerequisites: One year of calculus and consent of the instructor.

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.

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.

500. Fundamentals of Biostatistics with Linear Regression Analysis. 4 Hours. Primarily intended for biostatistics majors. Descriptive statistics, probability concepts, one- and two-sample statistical inference, and simple and multiple linear regression analysis. Statistical computer package used. Prerequisites: One year of college calculus, credit or concurrent registration in Bstt 420 and Stat 401, and consent of the instructor.

501. Advanced Regression and Experimental Design. 4 Hours. Primarily intended for biostatistics majors. Dummy variables; regression diagnostics; other regression methods; standard analysis of variance methods, repeated measures and nested designs. Emphasizes health sciences applications. Extensive computer use. Prerequisites: Credit or concurrent registration in Stat 411 and Bstt 500 and consent of the instructor.

510. Biostatistical Consulting. 2 Hours. Primarily intended for biostatistics majors. Discussion of techniques required for successful statistical consultation; effective communication, problem formulation, data analysis, oral and written reports, supervised consultation. Prerequisite: Bstt 501 or consent of the instructor.

515. Advanced Statistical Computing. 3 Hours. Primarily intended for biostatistics majors. Computer algorithms used in data analysis; computer solution of statistical problems; simulation; database management systems; jackknifing and bootstrapping. Prerequisites: Bstt 410 or the equivalent, FORTRAN, and consent of the instructor.

520. Nonparametric Statistics. 2 Hours. Primarily intended for biostatistics majors. Applications in one-sample location problems, k-sample location and dispersion problems, one-way

and two-way layouts, tests for independence and trend, goodness-of-fit, and correlation and regression problems. Prerequisites: Bstt 500, Math 450, and consent of the instructor.

530. Survival Analysis. 3 Hours. Primarily intended for biostatistics majors. 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 501 or consent of the instructor.

540. 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 consent of the instructor.

550. Categorical Data Analysis. 3 Hours. Primarily intended for biostatistics majors. Statistical analysis of categorical data, including classical methods, measures of association, modeling methods for multivariable data, logistic regression methods, repeated measures analysis. Computer methods emphasized. Prerequisites: Bstt 501 and 520 and consent of the instructor.

580. Applied Multivariate Analysis. 4 Hours. Primarily intended for biostatistics majors. Multivariate general linear model, repeated measures analysis, growth curve analysis; discriminant analysis, principal component analysis, factor analysis, linear panel modeling, cluster analysis; extensive computer application. Prerequisites: Bstt 501 and consent of the instructor.

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.

## 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.

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 ME450. 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. Multi-component 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.



## Chemical Engineering (ChE)

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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 Ph.D. students in engineering from non-English speaking backgrounds. Prerequisite: Acceptance into a Ph.D. program in engineering

591. ProMOTE Seminar II. 0 Hours. S/U grade only. Workshop in U.S. culture and society for Ph.D. students in engineering, from non-English speaking backgrounds. Prerequisite: Acceptance into a Ph.D. 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. M.S. 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. Ph.D. 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.
440. Intermediate Physical Chemistry. 4 Hours. Credit is not given for both Chem 440 and Chem 346. Introduction to the physical and theoretical basis for spectroscopic techniques used by organic chemists and biochemists. Statistical thermodynamics. Prerequisite: Chem 344 or the equivalent or graduate standing.
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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.
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 3.50 in science courses and consent of the instructor.
499. Supervised Research. 3 Hours. May be repeated for 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. Prerequisite: Consent of the instructor.
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.
522. Mass Spectrometry in Analytical Chemistry. 4 Hours. Modular components in modern analytical instrumentation. Quantification and processing of experimental data. Types of mass spectrometry and their analytical applications. Electron and ion spectroscopies. 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 multi-dimensional nuclear magnetic resonance (NMR) spectroscopy; applications of NMR to chemical analysis. Prerequisite: Chem 421 and 346, or the equivalents, or consent of the instructor.
530. Literature Seminar in Organic Chemistry. 1

## Chemistry (Chem)

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. 1 Hour. Solving problems in elucidation of structures of organic molecules, using NMR, IR, UV and mass spectroscopy. 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.

548. Statistical Mechanics. 3 Hours. Modern applications

and problems in statistical mechanics, ergodicity, density matrices, path integrals, liquid phase, linear response theory, generalized Langevin equation and introduction to critical phenomena. Prerequisites: Chem 448 and 542.

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.

552. Spectroscopy in Biophysical Chemistry. 4 Hours. Biophysical chemistry emphasizing optical spectroscopic techniques in the characterization of proteins and nucleic acids. Prerequisite: Chem 454 or consent of the instructor.

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 non-rigid 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. Ph.D. 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: CEMM 403.

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. Fundamentals of chemistry for environmental health professionals and engineers. Concepts of inorganic, physical, organic and colloid chemistry. Chemistry related to air pollution, water and wastewater treatment. 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.

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.

427. Engineering Hydrology. 4 Hours. Processes, techniques and concepts in hydrology of interest to the engineer: precipitation, interception, evaporation, groundwater, unit hydrographs, flood routing, and statistics. Prerequisite: CEMM 215.

428. Groundwater Hydraulics and Contaminant Transport Modeling. 4 Hours. Physics of groundwater flow. Regional groundwater flow and contaminant transport processes. Applications of finite difference and finite element methods in subsurface hydrology. Prerequisites: Math 220, EECS 170, and CEMM 215.

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.

## Civil and Materials Engineering (CEMM)

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. Structural similitude and dimensional analysis. Strain measurement techniques. Introduction to photoelasticity. Prerequisite: CEMM 430.

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. 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. Supermolecular structure of polymers. Glass transition temperature. Deformation and failure mechanisms in amorphous and semicrystalline 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.

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.

503. Advanced Methods of Urban Transportation Planning I. 4 Hours. Same as UPP 566. Transportation planning strategies, procedures for analyzing travel patterns, travel demand models, trip distribution models and network equilibrium. Prerequisites: CEMM 404, 513 and UPP 585, 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: CEMM 503 or 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. Transportation Management. 4 Hours. Same as UPP 563. Transit system planning, scheduling, pricing policy, and management; traffic control techniques and demand management; paratransit alternatives. Prerequisite: CEMM 513.

507. Urban Transportation II: Policy and Methods. 4 Hours. Same as UPP 561. 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: CEMM 513 or consent of the instructor.

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.

513. Urban Transportation I: Introduction. 4 Hours. Same as UPP 560. Transportation planning and linkages between it and urban land use and regional economic development. Recent trends, traditional problems and emerging issues.

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.

519. Stochastic Hydrology. 4 Hours. Analysis of



## Civil and Materials Engineering (CEMM)

hydrologic time series, frequency domain analysis, multi-variate and multidimensional stochastic models, estimation theory and state-space modeling of static and dynamic hydrologic systems. Prerequisites: CEMM 215 and EECS 270 and Stat 381, or the equivalents.

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.

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.

524. Water Chemistry. 4 Hours. Same as EOHS 542. Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. Physicochemical properties and environmental fate of organic pollutants. Prerequisite: CEMM 411.

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.

527. Analytical Hydrology. 4 Hours. Fundamental principles of the hydrological sciences including atmospheric, surface and subsurface hydrology. Prerequisite: Consent of the instructor.

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-Kirchoff 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.

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 Instability I. 4 Hours. Principles of elastic stability and their analytical, numerical, and experimental treatment. Types of instability. Buckling of columns, frames and machine components. 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

## Civil and Materials Engineering (CEMM)

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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. Ph.D. 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)

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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)

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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 coursework at other institutions through the CIC Traveling Scholar Program. Prerequisites: Admission to a doctoral program and approval of the Graduate College.

## Communication (Comm)

402. Group Communication Theory. 4 Hours. Nature of communication processes in different kinds of decision-making group contexts. Application to corporate business setting. Prerequisites: Comm 102 and 211, or consent of the instructor.

403. Rhetoric. 4 Hours. Same as Engl 402. Theories of rhetoric. Relationships of rhetoric to linguistics, literary criticism, philosophy, and psychology. Readings in classical, renaissance, eighteenth-century, and modern theories. Prerequisite: 9 hours of English or consent of the instructor.

404. Conversational Analysis. 4 Hours. Nonverbal aspects of communication; rules of communication; speech acts; conversational coherences; acts and sequences in communication; marital communication patterns. Prerequisite: Comm 101 or consent of the instructor.

405. Languages in Contact. 4 Hours. Bilingualism in individuals and societies. Language choice and politics. Language mixing. Diglossia. Language planning. Bilingualism and mass media. Prerequisite: Comm 101 or consent of the instructor.

410. Rhetorical Criticism. 4 Hours. Analysis and evaluation of critical standards for rhetorical interpretation. Application of critical standards to contemporary rhetorical events. Prerequisite: Comm 212 or 213, or consent of the instructor.

412. Linguistic Phonetics. 4 Hours. Same as Ling 412. The relationship of articulatory, acoustic, and auditory phonetics to the study of language. Prerequisite: Ling 410 or consent of the instructor.

413. Professional Speech Writing. 4 Hours. Theory and practice in writing manuscript speeches for presentations by leaders in government, business, and civic affairs. Prerequisites: Comm 100 and 213; or consent of the instructor.

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: One from Comm 211, 212, 213, or consent of the instructor.

430. Media News. 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 212 or 213; or consent of the instructor.

431. Educational TV Design. 4 Hours. Developing TV educational program up to production time. Audience profile. Learning objectives. Format decisions. Creating the message. Selling the program. Prerequisites: Comm 200 and 201 or consent of the instructor.

434. Global Communications. 4 Hours. Same as LAsT 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 103 and 300; or consent of the instructor.

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.

471. Communication Research: Team Project. 4 Hours. Faculty-directed team research on special topics in communication science. Prerequisites: Comm 201 and 301; or consent of the instructor.

473. Public Relations Planning. 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 or consent of the instructor.

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. Prerequisite: 12 hours of upper-division (200 or higher) courses in communication, with a 4.00 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 101 and at least two from Comm 212, 213, 230, 235, 305; or consent of the instructor.

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.

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.

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.

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.

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).

513. Persuasion. 4 Hours. Contemporary theory and research involving variables in the persuasive process.

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.



## Communication (Comm)

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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.

535. Mass Communication and Development. 4 Hours. Actual and potential uses of mass communication for the purposes of development in the Third World including national and international implications. Prerequisite: One course in the social sciences dealing with international issues, or consent of the instructor.

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, & 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.
402. History of Public Health. 2 Hours. An historical examination of the cultural and scientific forces that influenced how societies have handled problems that pose dangers to the health of the public.
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. Utilizing the public health core functions, explores the leadership style and practice through case studies and techniques which enhance leadership development. Prerequisites: CHSc 400 and 403 and consent of the instructor.
410. Public Health Aspects of Child and Family Development. 2 Hours. Mental health and development of the child, adolescent and family with application to public health service delivery. Prerequisite: CHSc 400 or consent of the instructor.
411. Nutrition for Public Health Professionals. 2 Hours. Foundation course to introduce nutrition principles and their application to the general public, including life cycle components and chronic diseases. Prerequisite: Consent of the instructor.
413. Principles of Delivering Public Health Nutrition Services. 3 Hours. 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 Human Sexuality. 3 Hours. Same as WS 419. Human sexuality, family planning, and resulting social effects from a public health perspective.
420. Health and Developmental Aspects of the Human Life Cycle. 2 Hours. Relates knowledge of the health and development of the adult to public health problems and programs.
421. Family Perspectives on Disability. 3 Hours. Same as Disability and Human Development 420 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.
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.
426. Public Health and Aging II. 3 Hours. Public health issues in aging related to the findings of basic biological research will be examined. Prerequisite: CHSc 400 or consent of the instructor.
427. Organization and Financing of Services to the Elderly. 3 Hours. Older Americans Act, senior centers, continuum of care, housing, transportation, day care, home care, nursing homes, protective services, older workers, income, and gerontology organizations. Prerequisite: CHSc 425 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.
441. Introduction to Maternal and Child Health. 2 Hours. Same as WS 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.
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 Research Methods. 3 Hours. Theoretical concepts in survey research; health science applications in survey design and planning, sample design and selection, questionnaire design, and data collection methods. Prerequisite: Bstt 400 or the equivalent.
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.
456. Women's Health: A Primary Health Care Approach. 3 Hours. Same as 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.
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. 2 Hours. Survey of biomedical, behavioral, educational and habilitative aspects of mental retardation and related disabilities. Prerequisite: Consent of the instructor.
471. Public Health Aspects of Chemical Dependency. 3 Hours. Extent and complexity of substance abuse as a public health problem and forces in society which influence development of public health policy or substance abuse. Prerequisites: Epid 400, Bstt 400, and CHSc 400.
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.
481. Exercise and Fitness Principles for Public Health Professionals. 2 Hours. Scientific and epidemiologic bases for exercise and fitness programs in health promotion and risk education. Students will critically analyze existing fitness programs.
485. Communications, Mass Media and Public Health. 3 Hours. Examines the development, theoretical bases, and assessments of mass media interventions, and the intended and

## Community Health Sciences (CHSc)

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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 (students generally will be preparing to take DrPH preliminary exams).

513. Advanced Public Health Nutrition. 3 Hours. Integration and application of public health nutrition principles. Prerequisite: CHSc 413.

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.

528. Societal Analysis of Aging, Health and Health Care. 3 Hours. Same as Sociology 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.

531. Topics in Psychosocial Epidemiology. 2 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced seminar on current selected topics in psychosocial epidemiology. Prerequisite: Epid 412.

542. Advanced Maternal and Child Health Applied Programs. 2 Hours. The interventions and services in health care programs for maternal and child populations. Emphasis on public sector programs, population needs and program evaluation. Prerequisite: CHSc 442.

543. MCH Policy and Advocacy. 2 Hours. Explores the social, economic and political dynamics which influence the development and implementation of MCH policy. Prerequisite: CHSc 441 or consent of the instructor.

545. Children's Mental Health. 3 Hours. Understanding the clinical panorama of child and adolescent mental, behavioral and developmental disorders; causes and determinants. Prevention, early intervention, reduction of risk for mental disorders. Prerequisite: 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.

561. Research Issues in Family Violence. 2 Hours. Current research concerns in family violence. Student prepares and presents a research proposal on some aspect of family violence. Prerequisite: CHSc 461 or consent of the instructor.

562. Mental Health of the Elderly. 3 Hours. Basic concepts of mental illness, mental health service delivery, and aspects of cognitive and emotional functioning in the elderly. Prerequisites: CHSc 460 and 425.

564. Community Integration in Developmental Disabilities. 2 Hours. Same as AHS 564. Origins of residential institutions for disabled persons in the U.S.; demographics; relevant legislation and court cases; and future directions.

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.

568. Contemporary Trends In Community Mental Health. 2 Hours. Overview of contemporary mental health treatment and prevention practices. Emphasizes issues of mental health services delivery for both the acute and chronically mentally ill. Prerequisite: CHSc 460 or consent of the instructor.

569. Mental Health in Urban Areas. 2 Hours. Mental health in urban areas with special reference to the problem of successful human adaptation. Examines the effects of physical and social environments. Prerequisites: Epid 412 and 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 480 and credit or concurrent registration in CHSc 446.

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.

## Criminal Justice (CrJ)

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402. Trial Interaction. 4 Hours. 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 WS 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.

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 250 or 255, and one 200-level criminal justice course.

480. Application of Science to the Law. 4 Hours. Same as PmPd 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. Prerequisite: CrJ 210 and 260, or graduate standing.

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. Classical Theories of Rule Breaking. 4 Hours. Critical examination of classical theories of crime and delinquency causation; emphasis on utilitarian, biological, psychiatric, economic, and social disorganization theories.

521. Contemporary Theories of Rule Breaking. 4 Hours. Critical examination of contemporary theories of crime and delinquency, including functional, anomie, 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.

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

## Criminal Justice (CrJ)

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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 data analysis. Development of critical perspective and identification of weaknesses in research design and measurement. Development of skills in data analysis interpretation and report writing. 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.

563. Evaluation Research in Criminal Justice. 4 Hours. Experimental, quasi-experimental, and non-experimental 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.

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 PmPd 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 PmPd 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 PmPd 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 PmPd 583. Pattern evidence: individualization, reconstruction; fingerprint classification, latent print development, AFIS; questioned documents; ink, paper, handwriting comparison; fire-arms 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 PmPd 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.

585. Chemical Microscopy and Ultramicroanalysis. 3 Hours. Same as PmPd 585. Critical application of chemistry and the polarizing microscope to observe chemical reactions and characterize substances on microscale. Prerequisites: CrJ 582 and consent of the director of graduate studies.

587. Medicolegal Identification and Investigation. 3 Hours. Same as PmPd 587 and Path 587. Survey of forensic medicine and medicolegal investigation; medical examiner, coroner systems of death investigation; wounds, patterns of injury, patterned injury; identification of human remains. Prerequisite: Consent of the director of graduate studies.

589. Special Topics in Forensic Science. 3 Hours. Same as PmPd 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.

598. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 10 hours of credit; a minimum of 6 hours is required. 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 credit. S/U 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 pre-college 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 Ph.D. 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 Ph.D. in Education program or the Ph.D. in Public Policy Analysis Program.

## Curriculum, Instruction, and Evaluation (CIE)

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 pre-school 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 Ph.D. in Education program or the Ph.D. 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 M.Ed. and Ph.D. 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 M.Ed. and Ph.D. 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

## Curriculum, Instruction, and Evaluation (CIE)

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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 Ph.D. in Education program or the Ph.D. in Public Policy Analysis program.

593. Ph.D. 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 Ph.D. 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 pre-announced 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.

## Dance (Dnce)

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447. Dance/Movement Therapy. 3 Hours. Dance and body movement are explored as a form of self-expression and as a healing tool.

## 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 non-parametric 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.

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.

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 Ph.D. 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.

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. Ph.D. 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 Ph.D. in Disability Studies program and consent of the instructor.



## Disability and Human Development (DHD)

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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 M.S. 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.

446. Qualitative Methods in Disability Research. 3 Hours. Methods of qualitative research as used in disability research. Comparisons of qualitative and quantitative approaches to research presentation of commonly used methods, issues of analysis and interpretation, and discussion of the use of participatory research methods.

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.

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.

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.

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.

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.

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. Prerequisite: Consent of the instructor.

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 M.S. 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 M.S. in Disability and Human Development program and consent of the instructor.

## Doctor of Arts (DA)

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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.

452. Physical Sedimentology. 4 Hours. Physical processes of sedimentation; sediment transport, bedforms and sedimentary structures, modern sedimentary environments and their ancient equivalents; facies models. Prerequisite: EaES 350.

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. Hydrogeology. 4 Hours. The occurrence, storage, movement, and quality of water in rocks, soils, and sediments with an emphasis on the nature of flow through porous or fractured materials. 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.

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.

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.

552. Advanced Sedimentology. 4 Hours. May be repeated for credit if topic is different for each registration. Advanced topics in modern sedimentology and sedimentary geology. Prerequisite: EaES 452.

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.

## Earth and Environmental Sciences (EaES)

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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.

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 M.S. 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 Math 165 or 180.

445. Probability and Statistics. 4 Hours. Same as IDS 482. Descriptive statistics, probability theory, discrete and continuous probability distributions, sampling distributions, estimation, hypothesis testing. Prerequisite: IDS 270 or consent of the instructor.

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.

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.

503. Nonmarket Decision Making. 4 Hours. A study of the analytics of group decisions. Some of the most common group decision rules will be examined in reference to the so-called voting paradox or its generalization, the impossibility theorem. The problem of ordinal versus cardinal utility will also be discussed in the context of social choice. Prerequisite: Econ 501 or consent of the instructor.

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 520.

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. Effects of governmental regulation and social environment on investment and production decisions. Effects of international differences in economic conditions, regulation and social environment. Prerequisite: Econ 520 or consent of the instructor.

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. Prerequisite: Econ 534 or IDS 532 or the equivalent.

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: Econ 537.

540. Economics for Public Policy Analysis. 4 Hours. Same as PPA 540. May not be taken for credit by students with credit in Econ 501 or 520. Concepts of economics applied to public policy analysis, models of industrial choice, economic concepts of cost, basic theory of markets, economic behavior of public and nonprofit organizations.



## Economics (Econ)

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541. Teaching Economics in the Secondary School. 4 Hours. Credit earned in Econ 541 may not be used to satisfy the degree requirements for the MBA, M.A. in Economics or Ph.D. in PPA (Economics) or Business Administration (Business Economics). Develops techniques for teaching the principles of economics that are central for teaching economics or incorporating economics in a social science curriculum in secondary schools.

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. Same as WS 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.

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 502 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 502 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 or MBA 502.

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 Ph.D. 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 M.A. thesis. Prerequisite: Consent of the chair of the thesis committee.

599. Ph.D. 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 Ph.D. thesis. Prerequisite: Consent of the chair of the thesis committee.

## 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 Ph.D. 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.

494. Topics in Educational Psychology. 1 to 4 Hours. May be repeated for a maximum of 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. 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 Ph.D. in Education program or the Ph.D. 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 Ph.D. in Education program or the Ph.D. 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 Ph.D. in Education program or the Ph.D. 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 Ph.D. in Education program or 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 content areas. Discussion of program and child evaluation. Provides supervised teaching experience in early childhood classrooms. Prerequisite: EPsy 520.

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 Ph.D. program in Education, Ph.D. program in Psychology, or Ph.D. 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 Ph.D. 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. Design of instruments and techniques for use in data collection in quantitative and qualitative educational research. Particular attention is paid to issues of validity, reliability, and bias. Prerequisite: Ed 490.

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.

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 MANOVA, discriminant and factor analysis, and latest variable modeling. Prerequisite: EPsy 547.

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.

## Educational Psychology (EPsy)

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593. Ph.D. 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 Ph.D. 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 Engineering and Computer Science (EECS)

407. Pattern Recognition I. 4 Hours. Same as Bioe 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. Matrix algebra for network analysis. Introductory network topology. Matrix loop, node, and state variable equations. Network functions and theorems. Topics in computer-aided analysis. Prerequisite: EECS 310.
412. Introduction to Filter Synthesis. 4 Hours. Fundamentals of network synthesis, filter approximation and frequency transformations. Passive filter synthesis. Design of resistively terminated networks. Active filter synthesis fundamentals. Prerequisite: EECS 310.
415. Image Analysis and Machine Vision. 4 Hours. 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: EECS 310.
417. Digital Signal Processing I. 4 Hours. Sampling theorem; Z-transform theory; discrete convolution; time and frequency domain characterization of digital filters; IIR and FIR digital filters; stability; the DFT and FFT algorithms and applications. Prerequisite: EECS 310.
418. Digital Signal Processing II. 4 Hours. Computer-aided design of digital filters; quantization and round-off effects; FFT algorithms; number-theoretic algorithms; hilbert transform; complex cepstrum; multi-rate signal processing; linear filtering; system identification; matching. Prerequisite: EECS 417.
420. Introduction to Microwave Engineering. 4 Hours. 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: EECS 322.
421. Introduction to Antenna Engineering. 4 Hours. 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: EECS 322.
422. Wave Propagation and Communication Links. 4 Hours. Antennas and propagation; wave propagation over ground, through ionosphere and troposphere; diversity principles; propagation effects in microwave systems, satellite, space, and radar links. Prerequisites: EECS 311 and 322.
424. Charged Particle Beams I. 4 Hours. Charge motion in homogeneous and inhomogeneous fields; accelerator orbit theory; collision processes; basic plasma phenomena; glow discharges. Introduction to sputtering, plasma etching, and free electron sources. Prerequisite: EECS 322.
426. Microwave Semiconductor Electronics. 4 Hours. 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: EECS 320, 340, and 346.
427. Modern Linear Optics. 4 Hours. 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: EECS 322.
428. Microwave Charged-Particle Devices. 4 Hours. Electron emissions, beam focusing techniques, linear-beam amplifiers and oscillators, traveling wave tubes, crossed field electron tubes, fastwave electron tubes, free electron laser. Prerequisite: EECS 322.
429. Plasma I. 4 Hours. Same as Phys 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to kinetic theory. Prerequisite: EECS 322.
430. Statistical Communications and Signal Processing. 4 Hours. Random processes, signal to noise ratio, spectral and correlation analysis, filtering of random processes, bandpass noise, noise in communications, statistical signal processing. Prerequisite: EECS 311 or consent of the instructor.
431. Analog Communication Circuits. 4 Hours. Analog communication circuits, oscillators, crystals, mixers, AM modulators/demodulators. FM modulators/demodulators. Commercial communication circuits. Laboratory. Prerequisite: EECS 311.
432. Digital Communications. 4 Hours. Information and channel capacity, baseband data transmission, equalization, signal detection, digital modulation schemes: ASK, PSK, FSK, MSK, M-ary signaling schemes. Prerequisite: EECS 430.
433. Computer Communication Networks. 4 Hours. Overview of communication networks, including delay analysis, data link protocols, point-to-point networks, multiple access, and local area networks. Prerequisite: EECS 430, or IE 342, or Stat 401.
442. Power Semiconductor Devices and Integrated Circuits. 4 Hours. Breakdown physics and 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 for circuit simulation. Prerequisite: EECS 340.
445. Analysis and Design of Power Electronic Circuits. 4 Hours. 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: EECS 310 and 342.
448. Transistors. 4 Hours. 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: EECS 346.
449. Microdevices and Micromachining Technology. 5 Hours. Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Laboratory work required. Prerequisite: EECS 347.
450. Automatic Control. 5 Hours. Control system-block diagram, flow graph, state variables. Transfer functions, state canonic forms. State space analysis. Feedback and integral control. Design using root locus. Prerequisite: EECS 310.
451. Digital Control. 5 Hours. Frequency response, Nyquist criterion and design. Computer control. Z-transform. Sampling, A/D and D/A signals. Digital design. Direct digital design. Root locus and state feedback. Prerequisite: EECS 450.
458. Electromechanical Energy Conversion I. 4 Hours. Electromagnetic forces and torque; magnetic circuits and transformers; DC machines; three-phase AC synchronous and induction machines; laboratory-demonstrations. Projects are required. Prerequisite: Grade of C or better in EECS 210.
459. Electromechanical Energy II. 4 Hours. Continues EECS 458. Completion of rotating machines; single-phase and two-phase machines; novel machines. Prerequisites: EECS 310 and 458, or consent of the instructor.
460. Computer Algorithms I. 4 Hours. Same as MSC 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 MCS 360 and Stat 381; or EECS 360.
465. Digital Networks. 4 Hours. Switching algebra, combinational logic, minimization techniques, sequential logic, synchronous and asynchronous circuits, fault-analysis, testing, fault detection, fault-masking, error-correction codes, hazards and races. Prerequisite: Grade of C or better in EECS 265.
466. Advanced Computer Architecture. 4 Hours. Design and analysis of high performance uniprocessors. Topics include arithmetic: multiplication, division, shifting. Processor:

## Electrical Engineering and Computer Science (EECS)

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pipelining, multiple function units. Instructure sets; memory: caches, modules; virtual machines. Prerequisite: EECS 366.

467. Introduction to VLSI Design. 4 Hours. MOS, CMOS circuits, VLSI technology, CMOS circuit characterization and evaluation. Static and dynamic MOS circuits, system design, faults, testing, and symbolic layout. Advanced topics. Laboratory. Prerequisites: EECS 340.

468. Analog and Mixed-Signal VLSI Design. 4 Hours. 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: EECS 467.

469. Computer Systems Design. 5 Hours. Digital design methodology and use of modern CAD tools for computer system design. Hardware description languages, simulation, design verification, synthesis. Design assignments, project using CAD. Prerequisite: EECS 465 or credit or concurrent registration in EECS 466.

470. Introduction to Software Engineering. 4 Hours. Software life-cycle model, requirement specification techniques, large-scale software design techniques and tools, implementation issues, testing and debugging techniques, software maintenance. Prerequisite: EECS 370.

471. Networked Operating Systems Programming. 5 Hours. Concepts, design and programming of multi-process and distributed systems; inter-process communications; fault tolerance; distributed programming semantics. Programming assignments and project required. Prerequisite: EECS 371.

472. Testing and Verification of Real-Time Software. 4 Hours. 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: EECS 361, EECS 371 and EECS 470.

473. Compiler Design. 4 Hours. Same as MCS 411. Lexical analysis, parsing schemes, semantic flow models, symbol table generation, run-time storage management, compile-time management of declarations, error detection techniques, and code generation. Prerequisites: Grade of C or better in either EECS 361 or MCS 441, and in either EECS 360 or MCS 360.

474. Object-Oriented Languages and Environments. 4 Hours. Data abstraction, classes and objects, messages and methods, polymorphism and dynamic binding, inheritance. Object-oriented design. Pure and hybrid object-oriented languages. Prerequisite: EECS 370.

476. Programming Language Design. 4 Hours. 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 275; or EECS 370.

478. User Interface Design and Programming. 4 Hours. 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: EECS 370.

480. Database Systems. 5 Hours. Database design, logical design, physical design. Relational, hierarchical and network databases. Recovery, concurrency control. Normalization. Prerequisite: EECS 370.

484. Artificial Intelligence I. 4 Hours. Problem representation; rule-based problem-solving methods; heuristic search techniques. Application to expert systems, theorem proving, language understanding. Individual projects. Prerequisite: EECS 370.

487. Computer Vision I. 4 Hours. Principles of interactive image processing. Electro-optical array sensors. Image-coding and

bandwidth compression techniques. Enhancement, restoration, segmentation, representation and description of images. Prerequisites: EECS 370, and either EECS 310 or consent of the instructor.

488. Computer Graphics I. 4 Hours. 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 EECS 370.

491. Seminar. 1 to 4 Hours. 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. No graduate credit for electrical engineering and computer science majors. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.

510. Advanced Network Analysis. 4 Hours. Characterizations of networks. The indefinite-admittance matrix. Active two-port networks. Theory of feedback amplifiers. Stability of feedback amplifiers. Multiple-loop feedback amplifiers. Prerequisite: EECS 410.

513. Advanced Filter Synthesis. 4 Hours. The active biquad. Sensitivity analysis. Realization of active two-port networks. Design of broadband matching networks. Theory of passive cascade synthesis. Prerequisite: EECS 412.

515. Image Analysis and Machine Vision II. 4 Hours. Image analysis techniques, 2D and 3D shape representation, segmentation, camera and stereo modeling, motion, generic object and face recognition, parallel and neural architectures for image and visual processing. Prerequisite: EECS 415 or consent of the instructor.

516. Optimal and Adaptive Digital Filters. 4 Hours. 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: EECS 417.

517. Digital Image Processing. 4 Hours. Operations on 2-D digital images such as transforms, enhancement, restoration, warping, segmentation, registration, compression, and reconstruction from projection. Prerequisite: EECS 417.

518. Theory of Nets. 4 Hours. 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. 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: EECS 420 and 421.

521. Computational Electromagnetics. 4 Hours. 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: EECS 520.

522. Advanced Microwave Theory. 4 Hours. Microwave integrated circuits: analysis, design. Microwave devices: filters, cavities and phase shifters. Millimeter waves: components and circuits, millimeter wave applications. Prerequisites: EECS 420 and 520.

523. Advanced Antenna Engineering. 4 Hours. 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: EECS 421 and 520.



## Electrical Engineering and Computer Science (EECS)

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526. Electromagnetic Scattering. 4 Hours. 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: EECS 520.

527. Optical Electronics. 4 Hours. 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: EECS 520.

528. Fiber and Integrated Optics. 4 Hours. Propagation in thin films and fibers. Mode launching, coupling, and losses. Sources, detectors, modulators, interferometers. Fabrication and measurement techniques. Fiber optics systems. Prerequisite: EECS 520 or the equivalent.

530. Statistical Communication Theory. 4 Hours. Probability for communications, properties and series representations of random processes, random processes through linear and non-linear systems, minimum MSE and maximum SNR systems. Prerequisite: EECS 430.

531. Detection and Estimation Theory. 4 Hours. Bayes, Neyman-Pearson and minimax detection for discrete and continuous time random processes. Estimation of random and non-random signal parameters. Estimation of signals. Prerequisite: EECS 530.

532. Advanced Digital Communications. 4 Hours. Characteristics of digitally modulated signals; digital signals in additive noise; communication over fading channels and with intersymbol interference; differential source encoding; synchronization; spread spectrum techniques. Prerequisite: EECS 531.

534. Elements of Information Theory. 4 Hours. Entropy and mutual information, asymptotic equipartition property stochastic process entropy rates, data compression Kolmogorov complexity, channel capacity, rate distortion theory, information theory applications. Prerequisite: EECS 430.

538. Information Flow in Systems. 4 Hours. Shannon's information theory, tool for detecting and analyzing system structure including computer methods. Relation between information and control. Information flow in complex systems. Prerequisite: Consent of the instructor.

540. Physics of Semiconductor Devices. 4 Hours. Same as Phys 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: EECS 346 or the equivalent.

541. Microelectronic Fabrication Techniques. 4 Hours. Current fabrication techniques of microelectronic technology; plasma and CVD processes; etching techniques; ion implantation; surface analytical methods. Prerequisite: EECS 540.

542. Semiconductor Device Theory. 4 Hours. 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: EECS 540.

544. Advanced Theory and Technology of Devices. 4 Hours. Theory, design, and technology of a selected semiconductor device at current research and industrial state-of-the-art level. Prerequisite: EECS 540.

545. Analysis and Design of Switching Power Converters. 4 Hours. 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: EECS 445.

550. Linear Systems Theory and Design. 4 Hours. State variable description, linear operators, impulse response matrix controllability and observability, irreducible realization, state feedback and state estimators and stability. Prerequisite: EECS 450.

551. Optimal Control. 4 Hours. 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: EECS 550.

552. Nonlinear Control. 4 Hours. 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: EECS 451.

553. System Identification. 4 Hours. On-line and off-line identification of control systems in frequency and time domain, considering noise effects, nonlinearities, nonstationarities and distributed parameters. Prerequisite: EECS 550.

557. Adaptive Systems. 4 Hours. Self-adaptive control, self-adaptive discrimination, self-adaptive filtering of noise in partial, complete parameters. Ignorance and inaccessibility to noise, convergence properties of filters and controllers. Prerequisite: EECS 554.

559. Neural Networks. 4 Hours. 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. 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.

561. Computability and Complexity Theory. 4 Hours. Turing machines, undecidability, Rice's theorem, recursively enumerable sets, complexity theory, hierarchy theorems, alternation, parallel complexity classes, complete problems. Prerequisite: EECS 361.

562. Advanced Algorithms. 4 Hours. Techniques of combinatorial optimization for building efficient computer algorithms and handling the intractability of NP-complete problems. Recursion, dynamic programming, greedy strategy, approximation algorithms, reductions, complexity. Prerequisite: EECS 460.

563. Applied Graph Theory. 4 Hours. 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.

564. Advanced Topics in Concurrent Computing Systems. 4 Hours. 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.

565. Advanced Switching Theory. 4 Hours. Principles of sequential circuit synthesis, structure of combinational switching circuits, multiple output and multi-level combinational circuits, fault-detection and testing in combination and sequential circuits. Prerequisite: EECS 465.

566. Parallel Processing. 4 Hours. 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: EECS 466.

567. Advanced VLSI Design. 4 Hours. VLSI subsystem and system design: synthesis, design styles, design process, testing. Case studies: switching networks, graphics engine, CPU. Projects use

## Electrical Engineering and Computer Science (EECS)

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computer-aided design tools. Prerequisite: EECS 467.

569. High-Performance Processors and Systems. 4 Hours. 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: EECS 466.

570. Advanced Topics in Software Engineering. 4 Hours. Formal methods; requirements and specification languages; program flow analysis; validation and verification; software metrics; program representations; software tools; software testing; software process. Prerequisite: EECS 470 or consent of the instructor.

571. Software Engineering Environments. 4 Hours. Software configuration management; software quality assurance; software engineering economics; software factory; software reuse; computer-aided software engineering; software prototyping. Prerequisite: EECS 570 or consent of the instructor.

572. Distributed Software Engineering. 4 Hours. Fundamental concepts of distributed software. Task allocation algorithms, language concepts for concurrency and communication, analysis methods and tools, and formal models. Prerequisite: EECS 470.

573. Distributed Computing Systems. 4 Hours. Distributed computing systems terminology and design issues. Data communications protocols; distributed operating systems, resource management, and synchronization; security; database systems. Prerequisites: EECS 366 and 371.

574. Workshop Program on Scientific Supercomputing. 4 Hours. Same as MCS 573. S/U grade only. Intensive laboratory immersion in supercomputing; working with existing computer programs to improve their performance by scalar, vector, and parallel optimization; techniques of compilation, profiling, debugging under CMS and Unix. Prerequisites: Concurrent registration in 4-8 hours of thesis research or a special projects course, and approval of the appropriate research project by the instructor and the student's advisor.

575. Formal Methods In Concurrent and Distributed Systems. 4 Hours. 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.

577. Object Stores. 4 Hours. 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. Prerequisite: EECS 371, EECS 480 and knowledge of C++, or consent of the instructor.

578. Human-Computer Interaction. 4 Hours. The computer-user interface: media, languages, interaction techniques, user modeling. Human factors in software development. Theory, experimental methods, evaluation, tools. Project required. Prerequisites: EECS 478.

579. Multi-Media Systems. 4 Hours. Principles of multi-media interface design for computer applications. Multi-disciplinary approaches to integrating text, still images, animation, and sound into human-computer interfaces. Prerequisite: EECS 478 or consent of the instructor.

580. Query Processing in Database Systems. 4 Hours. Same as IDS 511. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: EECS 480.

581. Database Management Systems. 4 Hours. Concurrency control; reliability, recovery, data integrity, database machines and current topics. Prerequisite: EECS 480.

582. Information Retrieval. 4 Hours. 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: EECS 480.

Prerequisite: EECS 480.

583. Logic Programming. 4 Hours. Logic programming theory and its application to databases, knowledge representation and knowledge bases. Prerequisite: EECS 480 or 484 or consent of the instructor.

584. Artificial Intelligence II. 4 Hours. 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: EECS 484.

585. Expert Systems. 4 Hours. 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: EECS 484.

587. Advanced Computer Vision. 4 Hours. 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: EECS 487.

588. Computer Graphics II. 4 Hours. 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: EECS 488.

589. Computer Animation. 4 Hours. 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: EECS 488.

590. Virtual Reality. 4 Hours. 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: EECS 488.

594. Special Topics. 1 to 4 Hours. 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. May be repeated. S/U grade only. Seminar by faculty and invited speakers.

596. Individual Study. 1 to 4 Hours. 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 EECS majors only. Prerequisite: Consent of the instructor.

597. Project Research. 0 to 9 Hours. S/U grade only. Students may register for more than one section per term. For EECS 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. M.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. For EECS majors only. MS thesis work under the supervision of a graduate advisor. Prerequisite: Consent of the instructor.

599. Ph.D. 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. For EECS majors only. PhD thesis work under supervision of a graduate advisor. Prerequisite: Consent of the instructor.

## 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. Same as Comm 403. 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. Survey of Milton's poetry and prose, with emphasis on *Paradise Lost*.
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 WS 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. 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 HAA 434 and WS 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 AAS 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: AAS 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. 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.

479. Religion and Literature. 4 Hours. Literary works considered in the light of several religious traditions.

480. Reading Black Women Writing. 4 Hours. Same AAS 470 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: 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. May be repeated 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. Prerequisite: Consent of the instructor.

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 department. Same as Ed 472. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for

teaching in the elementary or secondary school. 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.

499. Educational Practice with Seminar II. 6 Hours. S/U grade only. Graduate credit only with approval of the department. Same as Ed 473. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

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.

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: Non-Fiction Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on non-fiction 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.

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.



## English (Engl)

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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 course-work 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.

597. Research in English. 1 to 8 Hours. S/U grade only. May be repeated for a maximum of 12 hours of credit. Independent research in literature, creative writing, or language, literacy, and rhetoric. Prerequisites: Consent of the instructor and 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)

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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. Fundamentals of chemistry for environmental health professionals and engineers. Concepts of inorganic, physical, organic and colloid chemistry. Chemistry related to air pollution, water and wastewater treatment. 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.
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. 4 Hours. Same as CEMM 524. Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. Physicochemical properties and environmental fate of organic pollutants. 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.
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.

## Environmental and Occupational Health Sciences (EOHS)

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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)

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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.

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.

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. 2 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.

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)

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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.

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. Monetary and banking systems. The Federal Reserve System; domestic and international monetary policy. Prerequisite: Fin 300.

431. Theory and Structure of Financial Markets. 3 Hours. Consumption, saving, and the allocation of resources over time. Financial intermediation and the role of financial markets in allocating funds, absorbing risk, and providing liquidity. 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.

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.

500. Introduction To Corporate Finance. 4 Hours. Credit is not given for Fin 500 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. Prerequisites: Fin 500 and IDS 531.

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 and nature of money; monetary standards; development and operation of commercial banking and the Federal Reserve System. Theories of the supply and demand for money; the 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

## Finance (Fin)

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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. Ph.D. 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)

410. French Feminist Theory. 4 Hours. Same as WS 410. Taught in English. An introduction to French feminist theory, in particular feminist theories influenced by Lacanian psychoanalysis.

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 202 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 202 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 202 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 202 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 202 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 202 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 202 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 333 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 202 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 202 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 202 or consent of the instructor.

464. Topics in French Civilization. 4 Hours. 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 202 or consent of the instructor.

470. Educational Practice with Seminar I. 6 Hours. Same as Ed 470. 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 the elementary or secondary school. 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. Same as Ed 471. 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 the elementary or secondary school. 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 college or department of specialization.

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.

510. Seminar in Literary Studies. 4 Hours. May be repeated for a maximum of 12 hours of credit. 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.

## 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.

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. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

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 M.A. 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.

501. Seminar on Regional Development. 3 Hours. May be repeated for a maximum of 6 hours of credit. Analysis of the role of selected resources in regional development. Topics vary. Prerequisite: Geog 461 or consent of the instructor.

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. Anti-colonial liberation movements. Theories of neocolonialism, underdevelopment, dependency. Prerequisite: Geog 353

## Geography (Geog)

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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.

512. Seminar on Geography of the Inner City. 3 Hours. Formation, internal spatial structure and dynamics of ghettos and other inner-city slums in modern industrial cities. Critique of theories of ghetto formation, persistence and re-employment. Analysis of ghetto spaces in Chicago. Prerequisite: Geog 352 or consent of the instructor.

514. Management of Land and Urban Resources. 3 Hours. Same as EOHS 575. 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.

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.

## German (Ger)

400. German for Reading and Translation. 4 Hours. Credit may not be applied to major or advanced degree in German. Does not satisfy the graduation requirement in foreign languages. No graduate credit. Basic components of German grammar, sentence structure, and vocabulary. Selected texts in humanities, social sciences, and natural sciences. Prerequisite: Consent of the instructor.

401. Advanced German III. 4 Hours. Training in oral and written communication with particular emphasis on stylistics and accuracy of expression. Prerequisite: Ger 212 or the equivalent.

402. History of the German Language. 4 Hours. Phonological, morphological, lexical, syntactic development of German from origins to the present.

403. Introduction to Middle High German. 4 Hours. Middle High German grammar; related topics in the history of the German language; intensive translation of shorter passages; development of ability to read extended passages.

406. Foreign Language Computer-Assisted Instruction. 4 Hours. Same as Slav 406. Basic introduction to the use of computers in foreign language instruction. Each student must design and implement an instructional module as a term project. Prerequisite: Completion of the intermediate level, or the equivalent, in German, French, Spanish, or a Slavic language.

407. Methods of Foreign Language Teaching. 4 Hours. Modern theories of foreign language instruction. Survey of classroom techniques and test design and evaluation. Twenty hours of high school classroom observation required. Prerequisite: Ger 212 or the equivalent.

408. Techniques of Translation. 4 Hours. Guided practice in rendering German texts of various types into smoothly reading English.

411. The City as Cultural Focus. 4 Hours. May be repeated for a maximum of 12 hours of credit. Lectures in English. Knowledge of German not required. Readings and written work in German if credit is applied toward German major. Topics vary; the eighteenth-century city, Vienna in the 1890's, Berlin in the 1920's.

420. Perspectives on Literature 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 major or minor literary genre, with stress on literary analysis. Prerequisite: Two courses in German literature at the 300 level or consent of the instructor.

421. Perspectives on Literature II: Authors, Movements, Periods. 4 Hours. May be repeated for a maximum of 12 hours of credit if topic is different for each registration. Selected readings illustrating the biographical, social, cultural, and historical context of the literary work in a particular period, or a cultural theme transcending periods. Prerequisite: Two courses in German literature at the 300 level, or consent of the instructor.

422. Perspectives on Literature III: Themes. 4 Hours. May be repeated for a maximum of 12 hours of credit if topic is different for each registration. Selected readings having in common a particular theme, motif, or symbol, with stress on literary analysis and interpretation. Prerequisite: Two courses in German literature at the 300 level, or consent of the instructor.

437. Contemporary German Literature. 4 Hours. Literature of the German-speaking world since World War II, with emphasis on current issues and recent critical approaches to literature.

438. Goethe's Faust. 4 Hours. A great work of world literature, its origins, significance, reception, and interpretation.

439. Configurations of Femininity in German Literature. 4 Hours. Same as WS 439. May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Lectures and discussion in English. Readings must be done in German for credit toward a degree in German. The portrayal of women in major works from the German literary tradition. Readings in the social, economic,

intellectual, and religious background.

450. Business Operations in German-Speaking Countries. 4 Hours. Knowledge of German not required. The political, cultural, historical, and economic environment in which business operates in the German-speaking countries; the effects of this environment on international business.

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 3.75 overall grade point average, and a 4.00 grade point average in German; and approval of the Department.

492. Internship in International Business. 0-12 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: Concurrent registration in Ger 493 and Ger 211 and a GPA of 4.00 and approval of the Department.

493. Internship Seminar. 1-4 Hours. May be repeated for credit with approval of the Department. A maximum of 3 hours of credit may be applied toward the undergraduate degree in German and a maximum of 4 hours of credit toward the M.A. in German. 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: Credit or concurrent registration in Ger 492 and Ger 211 and a GPA of 4.00 and acceptance by a Departmental screening committee.

494. Educational Practice with Seminar I. 6 Hours. Graduate credit only with approval of the department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.

495. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

511. German Literature in Context I (800-1450). 4 Hours. Church and court as political and cultural centers; patronage and reception, orality and literacy, poetics and hermeneutics.

512. German Literature in Context II (1450-1750). 4 Hours. Major works of German literature from the periods of the Renaissance, Reformation, and the Baroque as well as selected texts from science, religion and philosophy. Prerequisite: Consent of the instructor.

513. German Literature in Context III (1750-1848). 4 Hours. Representative works of German literature, read in a sociohistorical context.

514. German Literature in Context IV (1848-present). 4 Hours. Representative works of German literature, read in a sociohistorical context.

531. Seminar on Special Topics. 4 Hours. May be repeated for a maximum of 12 hours of credit. In-depth study of a theme, genre or other element in German literature and culture not confined to a single historical period. Topics vary.

596. Independent Study for Graduate Students. 1 to 4 Hours. Prerequisite: Consent of the instructor.



## German (Ger)

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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. Ph.D. 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)

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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.

## Ancient Greek (GkA)

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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.

## Health Information Management (HIM)

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## Health Policy and Administration (HPA)

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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.

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. 2 Hours. Overview of the U.S. Healthcare System, including its evolution, utilization patterns, providers - human, institutional and organizational - financing, regulating, evaluating and reforming. Prerequisites: HPA 400 and CHSc 400, or 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.

444. Health Care Budgeting and Strategic Planning. 3 Hours. Budgeting systems in healthcare; budgeting techniques, flexible budgeting, cost behavior and forecasting, revenue and expense analysis; strategic planning in healthcare 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. 3 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 of microcomputers.

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: Credit or concurrent registration in IDS 531 or consent of the instructor.

511. Organization Theory Applied to Health Pro-

grams. 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.

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 Information Management. 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 one other course from among HPA 520, 531, or 550; 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 502; or consent of the instructor.

550. Topics in Health Information Management. 4 Hours. Same as BHIS 530. The study of advanced topics in various areas of health information management. Prerequisites: HPA 510, and one course from among HPA 520, 531, or 540; or consent of the instructor.

## Health Policy and Administration (HPA)

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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 Healthcare. 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.

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)

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401. General Histology. 5 Hours. Animals used in instruction. 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: First year standing in the Doctor of Dental Surgery program or 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 Cl 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 Cl 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 Cl 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 AAS 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 AAS 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 LAs 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 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.

474. History and Archives. 4 Hours. Same as WS 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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.

476. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

477. Topics in Middle Eastern History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

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 WS 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 women's studies or consent of the instructor.

## History (Hist)

485. Topics in African-American History. 4 Hours. Same as AASt 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 247 or 248 or 104 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 credit hours of history.

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. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

496. Topics in Race, Ethnic and Minority History. 4 Hours. Same as AASt 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 M.A. and Ph.D. 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. 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.

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. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Prerequisite: Preliminary examination.

## Human Nutrition and Dietetics (HND)

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410. Nutritional Biochemistry. 3 Hours. Biochemical basis for nutritional principles and concepts. Prerequisites: HND 310; or both HND 196 and CHSC 414; or the equivalent courses; 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: HND 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: HND 321, and concurrent registration in HND 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: HND 309 and HND 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: HND 421 and credit or concurrent registration in HND 422 or consent of the instructor.

430. Management in Human Nutrition and Dietetics. 2 Hours. Tools of management and management systems. Prerequisite: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 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: HND 410 and either PhyB 341 or Kine 352, or 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: HND 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: HND 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: HND 410 or consent of the instructor.

581. Dietetics/Nutrition Instructional Practicum. 2 Hours. Teaching practicum in clinical dietetics and/or nutrition. Prerequisites: HND 410 and 570 and 201 or the equivalent, or consent of the instructor.

594. Special Topics in Human Nutrition and Dietetics. 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: HND 410 or consent of the instructor.

595. Seminar in Human Nutrition and Dietetics. 1 Hour. May be repeated for credit with the approval of the Department. S/U grade only. Topics of current interest in human nutrition and dietetics. Includes discussions of current journal articles and important new developments in the specific disciplines. Prerequisite: HND 410 or consent of the instructor.

596. Independent Study in Human Nutrition and Dietetics. 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 and dietetics is carried out under the direction of a faculty member. Modes of investigation are determined by the nature of the problem selected. Prerequisite: Admission to the HND 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. S/U grade only. Students may register for more than one section per term. For graduate students who wish to pursue a project other than thesis research. Prerequisite: Consent of the instructor.

## Human Nutrition and Dietetics (HND)

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598. Research in Human Nutrition and Dietetics. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research in one area of human nutrition and dietetics. Prerequisite: Consent of the instructor.

599. Ph.D. 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 advisor. Prerequisite: Consent of the faculty advisor.

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. Industrial Automation. 4 Hours. Concepts in manufacturing and automation, automated flow lines, numerical control methods, industrial robots, computer-aided manufacturing, group technology and computer-integrated manufacturing. Prerequisites: IE 201 and EECS 170.
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. Prerequisite: EECS 170 or the equivalent.
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.
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, Markov 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.
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. Prerequisite: EECS 270 or the equivalent.
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.
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: IDS 531 or consent of the instructor.
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.



## Industrial Engineering (IE)

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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.

597. Master's Degree Project. 0 to 4 Hours. S/U grade only. May be repeated for a maximum of 4 hours of credit. Specialized projects under faculty supervision to satisfy the project requirement of the M.S. degree. Prerequisite: Consent of the faculty member.

598. M.S. 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. Ph.D. 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)

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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. Prerequisites: IDS 201, or a programming course in mathematics or electrical engineering and 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. Management Information Systems II. 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 or the equivalent. Business administration students must have declared a major.

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. Credit in IDS 410 or the equivalent is recommended. Business administration students must have declared a major.

410. Business Computer Technology. 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.

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 405 or 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 355 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 405 or 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.

440. Problems in Graph Theory. 4 Hours. Optimization problems: theory and solution. Shortest path problems. Transportation problems: maximum flows, dynamic flows, parametric flows. Matching problems: coverings, spanning trees, perfect graphs. Urban scheduling problems: traveling salesman problem, postman problem. Prerequisite: IDS 435 or consent of the instructor.

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. 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.

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.

464. Statistics: Theory and Applications. 3 Hours. Credit is not given for IDS 464 if the student has credit in IDS 531 and 532. Uncertainty and probability: binomial, normal, t, chi square and F distributions; estimation; hypothesis testing; analysis of variance; regression and correlation; time series.

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.

471. Multivariate Analysis II. 4 Hours. Multivariate techniques of data analysis in common use. Topics include principal components, factor analysis, canonical correlation. Prerequisite: IDS 470 or consent of the instructor. Business administration students must have declared a major.

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 multi-level 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 multi-variable transfer function models is also included. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

478. Advanced Regression Analysis. 4 Hours. Data collection and exploration, model building, single and multiple variable least squares, residual analysis, variable selection, multicollinearity, ridge regression, nonlinear regression. Prerequisite: IDS 371 or 482.

480. Cluster Analysis with Applications in Busi-

## Information and Decision Sciences (IDS)

ness. 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.

482. Probability and Statistics. 4 Hours. Same as Econ 445. Descriptive statistics, probability theory, discrete and continuous probability distributions, sampling distributions, estimation, hypothesis testing. Prerequisite: IDS 270 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.

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, Mathematics, or EECS 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 531.

507. 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: Consent of the instructor.

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 EECS 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 531.

511. Query Processing in Database Systems. 4 Hours. Same as EECS 580. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: EECS 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 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 510.

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 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 such as concurrency control, reliability, security and database administration. Prerequisite: IDS 505 or 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 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 510. Consent of the instructor is required of students not enrolled in the PhD program.

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 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 EECS 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 505 or 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. Prerequisite: 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. Prerequisites: IDS 505 or 510, and consent of the instructor.

531. Decision Models and Information Systems I. 4 Hours. Credit is not given for IDS 531 if the student has credit in MBA 503 and 509. First of a two-course sequence that integrates decision sciences and information systems. Emphasizes management information, inventory control and statistics. Prerequisite: Admission to the MBA program.

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. Second of a two-course sequence that integrates decision sciences and information systems. Emphasizes forecasting and decision models. Prerequisite: IDS 531.

533. Probabilistic Models in Management. 4 Hours. Methods, techniques and applications of stochastic analysis in management. Markov processes, Markovian decision theory, reliability, queuing theory, simulation, stochastic inventory control, stochastic optimization. Prerequisite: IDS 532.

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; Rockafeller and Lagrange duality; algorithms and numerical methods; applications to engineering design and economics. Prerequisite: IDS 545.

## Information and Decision Sciences (IDS)

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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.

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: IDS 531 or consent of the instructor.

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 Ph.D. 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. Prerequisite: Econ 534 or IDS 532 or the equivalents.

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 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. Ph.D. 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)

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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 consent as space permits. To obtain consent, see the SPH registrar.

420. Resource Data Bases 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.

514. Reproductive/Perinatal Epidemiology Data Seminar. 2 Hours. Using existing relevant databases 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.

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.

554. Occupational and Environmental Epidemiology. 2 Hours. 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.

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-M.S. 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-Ph.D. 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)

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400. History of the Italian Language. 4 Hours. General survey of the development of the Italian language. Prerequisite: Ital 303 or consent of the instructor.

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. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.

462. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.



## Jewish Studies (Jst)

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478. The Bible as Literature. 4 Hours. Same as Engl 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. Prerequisite: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

## Kinesiology (Kine)

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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.

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.

414. Teaching Sport Skills. 3 Hours. Applies principles derived from both laboratory and practical settings to increase the effectiveness of teaching and coaching motor skills. 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. Introduction to Adult Fitness. 3 Hours. Emphasis on physiological, psychological, and kinesiological aspects of the physical conditioning process. Diagnostic, prescriptive, instructional, and administrative procedures. Prerequisites: Kine 351 and 352.

421. Exercise Physiology I. 3 Hours. Current theories on the physiological responses to endurance exercise and training in healthy and diseased individuals. Prerequisite: Kine 352 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.

470. Sport Ethics. 3 Hours. Philosophical perspective of the nature and meaning of play, sport, and competition as they relate to the body, freedom, ethics, and contemporary issues. Prerequisites: Kine 350 and 400.

471. Sport History. 3 Hours. Evolution of sport from colonial days to contemporary times. Examines the impact of modernization, industrialization, urbanization, class, ethnicity, and religion on the development of American sporting patterns. Prerequisites: Kine 400 and 350.

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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.

491. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.

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.

505. Analysis of Teaching. 3 Hours. An analysis of teacher and student behavior; impact on learning outcomes; data based instrumentation and systems of observation, application and research.

510. Supervision of Instruction. 3 Hours. Techniques, research and procedures related to the science and area of supervision of teachers. Prerequisite: Kine 413.

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. Social Development in Physical Education. 3 Hours. Analysis of the impact of social trends and problems on kinesiology programs. Evaluation of contemporary affective and moral education programs in kinesiology. Prerequisites: 30 hours of kinesiology.

516. 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.

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.

## Kinesiology (Kine)

521. Current Research in Kinesiology. 1 Hour. May be repeated for a maximum of 3 hours of credit. 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. Prerequisite: Consent of the instructor.
523. Exercise Physiology: Health and Disease. 2 Hours. Same as PhyB 523. Interrelationships between exercise and various pathological conditions. Current research relating exercise with coronary heart disease, hypertension, diabetes, uremia and obesity. 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.
525. Exercise Physiology: Hormonal Implications. 2 Hours. Same as PhyB 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.
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.
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 HND 535. Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. Prerequisites: HND 410 and either PhyB 341 or Kine 352, or consent of the instructor.
551. Statistical Evaluation in Kinesiology. 3 Hours. Statistical procedures including basic parametric and nonparametric procedures of data analysis pertinent to kinesiology. Descriptive and inferential statistics are included. Prerequisites: Kine 355 and 590, or consent of the instructor.
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. Prerequisite: 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. Prerequisite: 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 519. Issues in motor control arising from static and dynamics of the musculoskeletal system, such as kinematic redundancy, moment-arm variation, bone stress, stability, and intersegmental effects in multijoint movements. Prerequisite: Consent of the instructor.
572. Motor Control and Learning I. 3 Hours. Advanced principles of the control and acquisition of complex, voluntary skills. Prerequisite: Kine 354.
573. Motor Control and Learning II. 4 Hours. Contemporary theories and models in motor control and learning. Prerequisite: Kine 572 or consent of the instructor.
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.
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 Option II (thesis, project, or internship) 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

## Kinesiology (Kine)

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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. Ph.D. 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)

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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 Studies (LAsT)

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434. Global Communications. 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. Prerequisites: Comm 103 and 300, or consent of the instructor.

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 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 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: LAsT 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 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 Studies majors with at least a 4.00 grade point average. Students in other programs or with lower than a 4.00 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.

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.



## Linguistics (Ling)

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.
412. Linguistic Phonetics. 4 Hours. Same as Comm 412. The relationship of articulatory, acoustic, and auditory phonetics to the study of language. Prerequisite: Ling 410 or consent of the instructor.
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.
420. Morphology. 4 Hours. Introduction to the theories and methods of morphological analysis. Prerequisite: Ling 405 or 410 or consent of the instructor.
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 WS 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 101 and at least two courses from Comm 212, 213, 230, 235, 305, or consent of the instructor.
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)

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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)

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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.

459. Business Policy. 3 Hours. Students may not receive credit for both Mgmt 459 and 495. The formulation and implementation of policies that determine the long-term character and performance of business firms. Analysis from the vantage point of top management. Prerequisites: Completion of all core requirements in the College of Business Administration. Students must be within two semesters of graduation.

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.

## Management (Mgmt)

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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. Same as Mktg 502. Credit is not given for Mgmt 502 if the student has credit in MBA 510. 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 M.S. in Accounting program.

541. Organizational Behavior. 4 Hours. Credit is not given for Mgmt 541 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 the 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. Prerequisites: 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.

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: Ph.D. student status or consent of the instructor.

570. Social and Legal Environment of the Firm. 4 Hours. Fundamental issues underlying current social and legal problems as they affect and are affected by business. The relationship among business, government and various publics, and the mechanism of social and legal change.

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, Ph.D. 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, Ph.D. 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, Ph.D. 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

## Management (Mgmt)

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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, Ph.D. 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, Ph.D. 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 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. Ph.D. 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 220, 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. Credit is not given for Mktg 500 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: Graduate student status in the College of Business Administration, or consent of the instructor.

502. Entrepreneurship. 4 Hours. Same as Mgmt 502. Credit is not given for Mktg 502 if the student has credit in MBA 510. 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.

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.

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; and 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.



## Marketing (Mktg)

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572. International Marketing. 4 Hours. Focuses on the firm that operates internationally from its home country base. Attention is particularly directed toward choosing and 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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 Ph.D. 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. Ph.D. 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)

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501. Management Accounting. 2 Hours. Credit is not given for MBA 501 if student has credit in Actg 500. Accounting as a decision making tool for managers. Topics examined include the role of accounting information, concepts, and principles, the accounting cycle, and financial statements. Prerequisite: Admission to the full-time MBA program.

502. Introduction to Economic Concepts for Business. 2 Hours. Credit is not given for MBA 502 if student has credit for Econ 520. Basic economic concepts applicable for business decision making. The market for goods and services and factors of production. Market exchanges. Relation between government and business. Prerequisite: Admission to the full-time MBA program.

503. Statistics. 2 Hours. Credit will not be given for MBA 503 if student has credit for IDS 531. Description of data, probability, sampling distributions, estimation hypotheses testing, linear and multiple regression performed with business software. Prerequisite: Admission to the full-time MBA program.

504. Business Finance. 2 Hours. Credit is not given for MBA 504 if student has credit in Fin 500. Introduction to financial management, valuation, financial analysis and planning. Emphasis on the interrelationships of financial management with the complementary functions of managers. Prerequisite: Admission to the full-time MBA program.

505. Organizational Behavior. 2 Hours. Credit is not given for MBA 505 if student has credit in Mgmt 541. The development of managerial leadership skills and how humans interact within formal organizations. Individual and group behavior, decision-making, organization culture, and organizational change. Prerequisite: Admission to the full-time MBA program.

506. Marketing Management. 2 Hours. Credit is not given for MBA 506 if the student has credit in Mktg 500. Consumer behavior and marketing principles as they relate to other areas of business activities. Product and service planning, pricing, promotion, and distribution of goods and services. Prerequisite: Admission to the full-time MBA program.

507. Operations Management. 2 Hours. Basic models of manufacturing operations, production planning, inventory systems, lean production. Operations strategy with case studies on quality, productivity, new products and process competition. Prerequisite: Admission to the full-time MBA program.

508. International Business. 2 Hours. The organization and management of international businesses stressing the effects of international cultural, economic and legal factors on the management function. Prerequisite: Admission to the full-time MBA program.

509. Management Information Systems. 2 Hours. Management and uses of information for decision making. Data sources, information flow, privacy and security issues, computer-based tools for planning and decision-making. Prerequisite: Admission to the full-time MBA program.

510. Entrepreneurship, Opportunities and Creativity. 2 Hours. Credit is not given for MBA 510 if the student has credit in Mktg 502. The nature of and macroeconomic importance of entrepreneurship, new ventures and smaller/midsize entrepreneurial companies. The inter-relationships between business functions. Prerequisite: Admission to the full-time MBA program.

590. Professional Topics. 3 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 full-time 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 international component of the full-time MBA program.

Prerequisites: Admission to the full-time 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: Second year full-time MBA student and consent of MBA Program Director.

594. Special Topics—MBA Program. 2 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 full-time 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.

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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. 3 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. 3 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. 3 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 EECS 460. 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 EECS 360.
411. Compiler Design. 4 Hours. Same as EECS 473. Lexical analysis, parsing schemes, semantic flow models, symbol table generation, run-time storage management, compile-time management of declarations, error detection techniques, and code generation. Prerequisite: Grade of C or better in either EECS 361 or MCS 441, and in either EECS 360 or MCS 360.
412. Computer Operating Systems. 4 Hours. Problems of designing and implementing an operating system for a modern digital computer or network of computers. Programming projects. Prerequisites: Grade of C or better in MCS 360.
415. Programming Language Design. 4 Hours. Same as EECS 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 EECS 370.
418. Discrete Simulation. 4 Hours. Identification and characterization of systems. Definition and classification of discrete (event-driven) simulations. SIMULA features. Use of the class concept. Prerequisite: Grade of C or better in MCS 360.
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; and Math 310 or 320 or 330.
423. Graph Theory. 4 Hours. Basic concepts of design theory, 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; and 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; and Math 310, 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.
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 360 or EECS 270.
472. Advanced Numerical Analysis. 4 Hours. Advanced numerical methods; eigenvalue problems, power methods, spline interpolation, FFTs, method of least squares, ODE shooting methods, matrix iteration methods, Gaussian quadrature, computer subroutine packages. Prerequisite: Grade of C or better in MCS 471 or the equivalent.
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. 1-4 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. Continuation of MCS 401. Advanced topics in algorithms. Lower bounds. Union-find problem. Fast fourier transform. Complexity of arithmetic, polynomial, and matrix calculation. Introduction to NP-completeness. Parallel algorithms. Prerequisites: 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.
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.
561. Algebraic Symbolic Computation. 4 Hours. Algebraic computation, including multi-precision arithmetic, arithmetic of polynomials, rational functions and power series, factorization techniques, and solving systems of equations and other related topics. Prerequisites: Grade of C or better in MCS 460 or the equivalent, and grade of C or better in Math 310 or 320, or consent of the instructor.
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-

## Mathematical Computer Science (MCS)

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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.

573. Workshop Program on Scientific Supercomputing. 4 Hours. Same as EECS 574. S/U grade only. Intensive laboratory immersion in supercomputing; working with existing computer programs to improve their performance by scalar, vector, and parallel optimization; techniques of compilation, profiling, debugging under CMS and Unix. Prerequisites: Concurrent registration in 4-8 hours of thesis research or a special projects course, and approval of the appropriate research project by the instructor and the student's advisor.

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.

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 MCS 190 or 260; and Math 480.

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 441 or Math 320.

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 480.

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.



## Mathematics (Math)

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, Poincare 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.

## Mathematics (Math)

555. Complex Manifolds II. 4 Hours. Dolbeault Cohomology, Serre duality, Hodge theory, Kodaira vanishing and embedding theorem, Lefschetz theorem, Complex Tori, Kahler 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, WKB 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, Poincare-Lindstedt, multiple scales, bifurcation theory, homogenization. Prerequisite: Math 481 or consent of the instructor.

580. Physical Principles of Applied Mathematics I. 4 Hours. Development of concepts and techniques basic to key mathematical models of physical phenomena; particularly discrete and continuum mechanics; derivation of the equations of fluid mechanics and elasticity. Prerequisites: Math 410 and 417 and 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.

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, Ausubel, 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.

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. 0-16 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 B.S. or M.S. in the Teaching of Mathematics program in Secondary Mathematics Education; and a 3.50 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, good academic standing in the B.S. or M.S. in the teaching of Mathematics program in Secondary Mathematics Education; and a 3.50 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: Math 210.

411. Advanced Euclidean Geometry II. 4 Hours. Axioms for Euclidean geometry are developed based upon reflections. Further concepts in Euclidean geometry that arise from these axioms are explored. Prerequisite: 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.

425. Computers in Secondary Education. 4 Hours. Programming in BASIC; issues related to the use of computers in a secondary school context. Prerequisite: Grade of C or better in Math 210, or consent of the instructor.

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 M.S. in the Teaching of Mathematics program.

438. Educational Practice with Seminar I. 6 Hours. Graduate credit only with the approval of the department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experience, and approval of the college or department of specialization.

439. Educational Practice with Seminar II. 6 Hours. Graduate credit only with the approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experience, credit or concurrent registration in MthT 438, and approval of the college or department of specialization.

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 M.S. 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 M.S. 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 M.S. 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 M.S. 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 M.S. 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.

## Mathematics Teaching (MthT)

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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 M.S. 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 M.S. 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.

585. Problem Solving with LOGO. 4 Hours. For elementary school teachers. LOGO and its use in the mathematics classroom, problem-solving techniques, basic computer science concepts. Geometry and list structures in LOGO. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

589. Practicum in Teaching Elementary School Mathematics. 4 Hours. Culminating experience for students in the M.S. in the Teaching of Mathematics program (option for elementary school teachers). Major project is required. Supervised weekly seminars. Prerequisites: Admission to the M.S. 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 M.S. 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)

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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.

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. Computational Thermo-Fluid Science. 4 Hours. Introduction to numerical solution methodologies in heat and mass transfer and in related fluid flows. Example problems include conduction, convection, radiation, combustion and other fields of interest. Prerequisites: ME 321 and 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.

436. Intermediate Dynamics. 4 Hours. Same as CEMM 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.

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 modelling of mechanical systems. Mesh generation for analysis. Apt programming and robotics. Prerequisites: Math 220 and EECS 170.

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.

480. Machine Tools and Metal Cutting. 4 Hours. Machine operations, mechanics of metal cutting, tool wear, cutting fluid and surface roughness, economics of metal cutting, chip formation mechanics, machine tool vibration, manufacturing system and automation. Prerequisite: ME 380.

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



## Mechanical Engineering (ME)

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. Analysis and Design of 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 413.

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.

527. The Finite Element Method in Transport Phenomena. 4 Hours. Development and implementation of the finite element method for solving linear and nonlinear differential equations encountered in fluid mechanics, heat and mass transfer. Prerequisites: EECS 270 and 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. Prerequisites: ME 421 or consent of the instructor, and EECS 270.

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.

530. Transport Processes in Porous Media. 4 Hours. Development of the governing equations for heat, mass, and momentum transfer in stationary or deforming porous media. Dealing with the mechanics of single- and multi-phase fluid flows. Prerequisite: ME 421 or consent of the instructor.

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.

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. Inversed nonequilibrium flows. Boundary layer flows with surface and gas-phase reactions. Frozen and equilibrium criteria. Waves in relaxing media. ME 516 and 514 or 522.

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.

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.

597. Master's Degree Project. 0 to 4 Hours. May be repeated for a maximum of 4 hours of credit. S/U grade only. Specialized projects under faculty supervision to satisfy the project requirement of the Master of Science degree. Prerequisite: Consent of the faculty member.

598. M.S. 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. Ph.D. 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 Education (MHPE)

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412. Educational Issues in Emerging Health Care Delivery Systems. 3 Hours. Examines the health professions education implications of the rapidly changing U.S. health care system. Considers alternative ways of organizing education for new settings. Prerequisite: CHSc 445 or consent of the instructor.

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. Principles of Research Design. 3 Hours. Overview of experimental, quasi-experimental and naturalistic approaches to research. Topics include research design, methodological strategies, forms of data collection, data analysis and reporting of results. Examples from education, social science and clinical science.

432. Construction and Use of Tests To Measure Cognitive Performance. 3 Hours. All phases of the development, administration, scoring, and reporting of written examinations will be covered. Additional topics include validity, reliability, and standard setting methods.

441. Clinical Decision Making. 3 Hours. Introduction to decision analysis, statistical properties of clinical evidence; Bayes theorem; decision trees; utility assessment; applications to clinical problems; contrasts with intuitive clinical judgment. Prerequisite: An introductory statistics or epidemiology course or consent of the instructor.

494. Special Topics in Health Professions Education. 1 to 4 Hours. Selected topics of current interest in health professions education.

501. Current Issues in Health Professions Education. 4 Hours. Examines how historical, social, policy, and organizational factors influence education in the health professions.

502. Instruction and Assessment for Health Professionals. 3 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.

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.

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)

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413. Images of Pharmacy in the Arts. 2 Hours. Same as PmAd 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.

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.

446. Ethics for Health Professionals. 2 Hours. Foundations of ethical theory and a range of practical problems will be viewed in the light of classical and modern texts of health care ethics.

448. AIDS and Ethics. 2 Hours. Ethical issues involved with screening, testing, and treating AIDS will be discussed in the context of public health prerogatives and responsibilities. Individual rights will be evaluated.

449. Confronting Death. 2 Hours. Different levels of understanding death will be surveyed. Public policy issues and clinical concerns in a range of practical problems, including save or let die decisions, living wills, and euthanasia will be considered.

461. Policy Issues in Protecting Health. 2 Hours. Ethical issues stemming from release of toxic substances or use of medical devices and/or drugs in non-prescribed manner will be discussed.

494. Special Topics in Medical Humanities. 1 to 4 Hours. Presents special topics in selected aspects of medical humanities for health professionals.

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)

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407. Clinical Laboratory Management. 2 Hours. Overview of management principles; recruitment and hiring of personnel; laboratory organization of personnel and resources; managing cost effectiveness; quality assurance; laboratory safety; federal and state regulatory aspects; legal implications. Prerequisite: Credit or concurrent registration in MLS 417 or 418, or certification, or consent of the instructor.

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.

424. Clinical Laboratory Automation. 3 Hours. Electronic and electrical/mechanical aspects of operation, troubleshooting, and maintenance of in vitro analytical systems used in clinical laboratories. Emphasizes semiautomated, automated, and computer-assisted systems of continuous-flow and discrete-sample analysis; also, biochemical and hematological profiling systems. Prerequisite: Consent of the instructor.

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. 2 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.

531. Hematology II. 2 Hours. Etiology, pathophysiology, clinical manifestations, and treatment of primary hematologic diseases; anemia, leukemia, myeloproliferative disorders, and myelodysplasia; genetic, biochemical, and extracellular causes for hematologic disease. Prerequisites: MLS 530, 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.

550. Clinical Microbiology: Clinical Bacteriology. 3 Hours. Advanced clinical laboratory aspects of microbiology, including the usual isolated pathogenic organisms and recognized bacteria. Emphasis is on current clinical laboratory procedures and practices, and the impact on infectious disease diagnosis and treatment. Prerequisites: Certification and consent of the instructor.

551. Clinical Microbiology and Infectious Diseases. 3 Hours. Advanced clinical aspects of microbiology on specified infectious diseases, and the role of clinical laboratory in diagnosis and prevention. Emphasis on current procedures and practices. Prerequisites: MLS 550, certification, and consent of the instructor.

552. Clinical Microbiology: Mycology. 3 Hours. Advanced clinical laboratory mycology with emphasis on identification methods and new laboratory procedures. Prerequisites: MLS 550, certification, and consent of the instructor.

553. Clinical Microbiology: Parasitology. 3 Hours. Clinical laboratory parasitology stressing biology, ecology, life cycles, diagnostic stages and epidemiology of human metazoan parasites. New theories and measures for control are addressed. Prerequisites: MLS 550, certification, and consent of the instructor.

554. Clinical Microbiology: Virology. 3 Hours. Classification and structures of viruses; host response; clinical manifestations, pathogenesis and diagnosis of viral infections; clinical and laboratory features emphasized. Prerequisites: MLS 550, certification, and consent of the instructor.

560. Blood Groups: Systems and Serology. 3 Hours. Red cell immunology, genetics and membrane biochemistry; current concepts, theories, genetics and serology of human blood group systems; status of related antigens systems; parentage testing; related clinical serology; forensics; recent biotechnology. Prerequisites: General knowledge of blood group systems, certification, and consent of the instructor.

561. Clinical Immunohematology and Transfusion. 2 Hours. Blood cell metabolism, preservation and destruction; clinical analysis of in vivo sensitization; hemapheresis; blood products and transfusion guides; transfusion associated diseases. Prerequisites: MLS 560, certification, 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: MLS 561 certification 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. Prerequisite: MLS 562 or consent of the instructor.

## Medical Laboratory Sciences (MLS)

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564. Current Trends in Immunohematology. 2 Hours. Advanced studies of current trends; assigned topics in current literature read, evaluated and discussed. Prerequisites: MLS 563 and consent of the instructor.

570. Clinical Laboratory Instructional Practicum. 2 to 3 Hours. Selection of content for undergraduate instruction; design of instructional strategies and evaluation instruments for classroom and laboratory; development of skills in instructional and evaluation methods. Prerequisites: MHPE 421 and consent of the instructor.

571. Clinical Laboratory Management Practicum. 2 to 3 Hours. Guided experience in planning, organizing, staffing, directing, and controlling the clinical laboratory, or one of its departments. Prerequisites: HRM 400 and consent of the instructor.

581. Forensic Analysis of Biological Evidence. 4 Hours. Same as PmPd 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 PmPd 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.

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.

## Medical-Surgical Nursing (NuMS)

510. Nursing Management of Common Health Problems in Tertiary Care. 3 Hours. Advanced practice in medical-surgical nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and management of adults with common health problems in tertiary care. Prerequisites: Credit or concurrent registration in NuSc 530 and 531 and 532.
511. Practicum in Common Health Problems in Tertiary Care. 4 to 6 Hours. Practicum emphasizing the clinical evaluation, symptom management, education and case management of adults with common health problems in tertiary care. Prerequisites: Credit or concurrent registration in NuMS 510 and consent of the instructor.
512. Nursing Management of Neuro-Cognitive/Musculo-Skeletal Patients. 3 Hours. Concentration on advanced medical-surgical nursing covering pathophysiology, etiologies, clinical evaluation and management of adults with selected neuro-cognitive/musculo-skeletal conditions at various stages of illness. Prerequisite: NuMS 510.
513. Practicum in Neuro-Cognitive/Musculo-Skeletal Nursing. 6 Hours. Practicum emphasizing the clinical evaluation, symptom management, education, and case management of adults with selected neuro-cognitive/musculo-skeletal conditions at various stages of illness. Prerequisites: NuMS 511 and credit or concurrent registration in NuMS 512.
514. Nursing Management of Oncology/HIV Patients. 3 Hours. Concentration on advanced nursing practice in oncology/HIV covering pathophysiology, etiologies, clinical evaluation and management of adults at various stages of illness. Prerequisite: NuMS 510.
515. Practicum in Oncology/HIV Nursing. 6 Hours. Practicum emphasizing the clinical evaluation, symptom management, education and case management of adults with selected oncology/HIV conditions at various stages of illness. Prerequisites: NuMS 511 and credit or concurrent registration in NuMS 514.
516. Nursing Management of Cardiopulmonary Patients. 3 Hours. Concentration on advanced medical-surgical nursing covering pathophysiology, etiologies, clinical evaluation, and management of adults with selected cardiopulmonary conditions at various stages of illness. Prerequisite: NuMS 510.
517. Practicum in Cardiopulmonary Nursing. 6 Hours. Practicum emphasizing the clinical evaluation, symptom management, education, and case management of adults with selected cardiopulmonary conditions at various stages of illness. Prerequisites: NuMS 511 and credit or concurrent registration in NuMS 516.
518. Nursing Management of Critical Care Patients. 3 Hours. Concentration on advanced medical-surgical nursing covering pathophysiology, etiologies, clinical evaluation and management of critically ill adults. Prerequisite: NuMS 510.
519. Practicum in Critical Care Nursing. 6 Hours. Practicum emphasizing the clinical evaluation, symptom management, education and case management of critically ill adults. Prerequisites: NuMS 511 and credit or concurrent registration in NuMS 518.
521. Practicum in Common Health Problems in Tertiary Care-CNS. 4-6 Hours. Practicum for clinical nurse specialists emphasizing clinical practice, education, research and consultation related to care of adults with common health problems in tertiary care. Prerequisites: Credit or concurrent registration in NuMS 510 and consent of the instructor.
522. Practicum: Tertiary Nurse Practitioner. 4 to 6 Hours. Practicum emphasizing the comprehensive clinical evaluation and management of adults with complex health problems in tertiary care. Prerequisites: NuMS 513 or 515 or 517 or 519 and consent of the instructor.
523. Practicum in Neuro-Cognitive/Musculo-Skeletal-CNS. 6 Hours. Practicum for clinical nurse specialists emphasizing clinical practice, education, research and consultation related to the care of adults with neuro-cognitive/musculo-skeletal conditions. Prerequisites: NuMS 521 and credit or concurrent registration in NuMS 512.
525. Practicum in Oncology/HIV Nursing-CNS. 6 Hours. Practicum of clinical nurse specialist emphasizing clinical practice, education, research and consultation related to care of adults with oncology/HIV conditions. Prerequisites: NuMS 521 and credit or concurrent registration in NuMS 514.
527. Practicum in Cardiopulmonary Nursing-CNS. 6 Hours. Practicum for clinical nurse specialists emphasizing clinical practice, education, research and consultation related to care of adults with cardiopulmonary conditions. Prerequisites: NuMS 521 and credit or concurrent registration in NuMS 516.
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.
541. HIV and AIDS: Dimensions and Issues. 3 Hours. Social, cultural, ethical and legal issues resulting from the AIDS epidemic. Workplace issues, prevention, symptoms and treatment. The epidemic in its social implications. Prerequisite: Consent of the instructor.
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.

## Medical-Surgical Nursing (NuMS)

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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.

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.

563. Publishing in Nursing. 2 Hours. Discuss issues in publishing for nursing including selecting journals, topics, critiquing articles, legal/ethical issues. Writing query letters, media reviews, outlines for articles required. 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.

567. Principles of Exercise and Cardiac Rehabilitation. 3 Hours. Comprehensive overview of cardiovascular disease rehabilitation process. Concepts and principles of advanced cardiovascular pathophysiology, risk assessment, exercise responses, prescription in cardiac disease and exercise testing. Prerequisite: NuSc 530 or a graduate-level physiology course or consent of the instructor.



## Medicinal Chemistry (MdCh)

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412. Pharmaceutical Applications of Molecular Biology. 2 Hours. Same as PmMP 412. Introduction to molecular biology for pharmacy students. Recombinant DNA techniques and monoclonal antibodies, with emphasis on diagnostic and therapeutic applications. Prerequisite: PmMP 301.

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.

561. Principles of Medicinal Chemistry. 3 Hours. Concerns basic chemical and physical principles necessary for an understanding of drug action. These principles are applied in the design 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. Emphasizes spectroscopic methods useful in solving structural problems and in analyzing dynamic biological processes. Prerequisite: One year of physical chemistry or consent of the instructor.

564. Physical Medicinal Chemistry. 3 Hours. Kinetics and thermodynamics in biological systems. Applications to drug action 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. Prerequisite: MdCh 561.

594. Special Topics in Medicinal Chemistry. 2 to 4 Hours. An advanced course covering selected topics that may include new spectroscopic, theoretical, chemometric, and synthetic approaches to biomolecular structure and function. Prerequisites: One year of physical chemistry, one semester of biochemistry, and MdCh 562 and 561, 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.

## Medicine (Med)

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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. Immunology and Host Defense. 2 Hours. Mechanisms of host defense; antigens, immunoglobulins and their reactions; antibody synthesis, regulation and the cellular immune response; hypersensitivity and immune injury; tissue transplantation; tumor immunity. Prerequisite: Registration in the College of Medicine or 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.

451. Immunology. 3 Hours. Basic concepts in immunochemistry, immunogenetics, molecular immunology, cellular immunology and immunopathology. Prerequisites: Graduate standing or consent of the instructor and concurrent registration in Bche 460 or the equivalent.

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 oncogenes; 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.

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.

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. M.S. 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)

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501. Faculty Research Seminars. 1 Hour. S/U grade only. Should be taken in the first year in the Ph.D. in Molecular Genetics program. Faculty presentation of research areas within molecular genetics. Prerequisite: Graduate standing in the Ph.D. 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.

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. Ph.D. 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 Ph.D. in Molecular Genetics program.

## Neuroscience (Neus)

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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.

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.

443. Ethnicity and Health: Application to Nursing. 2 Hours. Theories and research relevant to health and nursing care of United States subcultural and ethnic groups are examined. 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. Conceptual Systems in Nursing. 3 Hours. Analyzes classical philosophical arguments from a historical perspective with application to nursing. Methods of scientific explanation and reasoning useful in nursing examined. Prerequisites: NuSc 527 or the equivalent and consent of the instructor.

506. Nursing Theory Development. 3 Hours. Critically examines theory development in nursing including the biological and behavioral frameworks from which nurse theorists' work is based. Prerequisite: NuSc 505.

511. Advanced Nursing Research Design. 3 Hours. In-depth analysis of research design including such areas as design validity, sampling, research ethics, and interpretation. Application of the content to nursing and related research. Prerequisite: NuSc 527 or the equivalent and consent of the instructor.

515. Measurement in Nursing Research. 4 Hours. Review theories of measurement and techniques for assessing reliability and validity. Critical analysis of measurement issues in nursing and related fields with emphasis on improving data quality. Prerequisite: NuSc 511 or the equivalent or consent of the instructor.

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 life span, 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. 2 Hours. Introduction to educational theory, methods, and strategies for nursing instruction and evaluation in classroom and clinical teaching. Prerequisite: Consent of the instructor.

541. Teaching Practicum for the Nurse Educator.

3 Hours. Application of educational theory, methods, and strategies for nursing instruction and evaluation in classroom and clinical learning settings. Prerequisite: Credit or concurrent registration in NuSc 540 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.

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.

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.

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.

## Nursing Sciences (NuSc)

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598. Thesis Research: Master's. 0 to 16 Hours. S/U grade only. Master's student thesis research. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. Doctoral student thesis research. Prerequisite: Consent of the instructor.



## Occupational Therapy (OT)

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.

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.

503. Sensory Integration Theory. 4 Hours. Covers sensory integration theory as a basis for the evaluation and treatment of individuals with sensory integration problems. Introduces interpretation of the SIPT and related cognitive-perceptual-motor disorders. Prerequisite: Consent of the instructor.

504. Evaluation of Sensory Integration. 4 Hours. Covers administration and interpretation of the Sensory Integration and Praxis Tests. Prerequisites: OT 503 and consent of the instructor.

505. Decision-Making Skills for Therapists Practicing in Public School. 4 Hours. Roles of OTs and PTs in school systems are examined. Critical reasoning and decision-making skills related to legal and environmental factors affecting practice are emphasized. Prerequisite: Consent of the instructor.

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.

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.

542. Implications of Play and Leisure in Occupational Therapy. 4 Hours. Theories of play and the relationship of play to health and adaptation. Focuses on practical application of play in occupational therapy. Prerequisite: 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.

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.

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.

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 Ph.D. 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 M.S. 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. M.S. 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.

## Oral and Maxillofacial Surgery (OSur)

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501. Applied Anatomy of the Head and Neck I. 3 Hours. S/U grade only. Dissection of the head and neck with emphasis on surgical approaches and techniques. Prerequisite: Anat 312 or the equivalent.

510. Pain Control Seminar. 3 Hours. S/U grade only. 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. Orthognathic Surgery Seminar. 1 Hour. S/U grade only. 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. S/U grade only. This course will cover in depth the methods of obtaining a history and performing physical diagnosis of the entire body through theoretical and practical lesions.

598. Thesis Research. 0 to 16 Hours. S/U grade only. Students design and conduct a research project with faculty guidance in partial fulfillment of the requirements for the Master's degree. Prerequisite: Consent of the thesis advisor.

## 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)

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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)

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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 M.S. 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)

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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.

504. Ultrastructural Pathology. 2 Hours. Lectures on the principles and use of all aspects of electron microscopy in the fields of both experimental and diagnostic pathology. Prerequisite: Path 425 or consent of the instructor.

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 Medical Laboratory Sciences 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.

587. Medicolegal Identification and Investigation. 3 Hours. Same as CrJ 587 and PmPd 587. Survey of forensic medicine and medicolegal investigation; medical examiner, coroner systems of death investigation; wounds, patterns of injury, patterned injury; identification of human remains. Prerequisite: Consent of the director of graduate studies.

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)

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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.

598. Research in Pediatric Dentistry. 0 to 16 Hours. S/U grade only. Students register for this course when working on their research requirements for the program. Prerequisite: PedD 411.



## Pharmaceutics (PmPc)

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401. Pharmaceutical Manufacturing Unit Processes. 2 Hours. Manufacturing processes applied to pharmaceutical production: heat transfer, including conduction, convection, and boiling; drying; fluid flow; mixing; filtration; sterilization. Developing understanding of underlying principles. Prerequisite: Math 210 or the equivalent.

407. Research Methods in Pharmaceutics. 2 Hours. Introduction to research methodology and the principles of scientific investigation.

495. Introduction to Pharmaceutical Biotechnology. 3 Hours. The nature, formulation and manufacture by modern methods of biological response modifiers, especially proteins, including problems involved in their manufacture, storage and use. Prerequisite: PmMP 301 or consent of the instructor.

504. Pharmaceutical Kinetic Theory. 2 Hours. Aspects of kinetics relevant to pharmaceutics are to be covered in this course.

505. Stability of Pharmaceutical Systems. 2 Hours. Kinetics of stability, types of reactions and techniques used to predict and evaluate the stability of selected dosage forms.

506. Industrial Experience. 4 to 10 Hours. Recommended for graduate students with no industrial experience. Students spend time working in industry under academic supervision to obtain practical experience. Prerequisite: Completion of all course requirements.

510. Colloid and Surface Chemistry. 3 Hours. Introduction to the principles of colloid and surface chemistry. Interactions between colloidal particles as well as the nature of interfaces both liquid and solid. Phase behavior of surfactants as well as the detailed properties of suspensions and microemulsions. Prerequisite: Math 480 or the equivalent.

520. Advanced Physical Pharmacy. 3 Hours. Quantitative and theoretical principles of science as they apply to pharmacy. Principles from thermodynamics, kinetics, interfacial phenomena and colloid chemistry will be used to evaluate pharmaceutical formulations. Prerequisites: Phar 323 and Math 220 or the equivalent, or consent of the instructor.

525. Dissolution and Bioavailability of Dosage Forms. 2 Hours. Theories and testing of release of drug from solid dosage forms. Effect of dissolution rate on bioavailability. Prerequisite: PmPc 303 or the equivalent.

530. Size Characterization of Drugs. 2 Hours. Size characterization methodology as applied to particulate solid and liquid drugs, and drug delivery systems in dispersed and compacted states.

550. Drug Standards and Quality Control. 2 Hours. Drug standards and specification limits for identity and purity. Compendial tests, quality control (CGMP), good laboratory practices (GLP), and finished product specifications. Prerequisite: Chem 421.

575. Controlled Drug Delivery. 3 Hours. Controlled drug delivery for sustained release and drug targeting. Synthesis of biodegradable polymers and mathematical modeling of the diffusion process in polymer drug delivery systems. All routes of administration. Prerequisite: Math 480 or the equivalent.

576. Percutaneous Drug Delivery. 2 Hours. 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: PmPc 575 or consent of the instructor.

580. Liposomes as Drug Delivery Systems. 2 Hours. Preparation, properties, pharmaceutical application, targeting and stability of liposomal products. Prerequisite: PmPc 303.

593. Experimental Methods in Pharmaceutics. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research in pharmaceutics not related to thesis research.

595. Seminars in Pharmaceutics. 0 to 2 Hours. S/U grade only. Exposure to current research and experimental techniques within the discipline of pharmaceutics. Methods of proper presentation of scientific information.

598. Master's Thesis Research. 0 to 16 Hours. S/U grade only. Master's thesis research and preparation.

599. PhD Thesis. 0 to 16 Hours. S/U grade only. Thesis research and preparation.

## Pharmacodynamics (PmPd)

420. Pharmacology I. 5 Hours. Drug actions, uses, and effects. Principles underlying rational therapeutics. Emphasis on drugs affecting the peripheral nervous system, heart and cardiovascular function, renal system, and endocrine system. Prerequisite: Consent of the instructor.

421. Pharmacology II. 5 Hours. Animals used in instruction. Emphasis on drugs affecting the central nervous system, drugs used to relieve pain, chemotherapeutic agents including antineoplastics, antivirals, antimicrobials, antitubercular, and anti-AIDS. Prerequisite: Consent of the instructor.

423. Adverse Drug Reactions. 2 Hours. 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. Prerequisite: PmPd 421 or the equivalent, or consent of the instructor.

480. Application of Science to the Law. 4 Hours. 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.

494. Chronopharmacology. 2 Hours. Biological rhythms as the basis for appreciating the significance of chronopharmacology to the delivery of health care services with particular emphasis on possible explanations of unusual pharmacotherapeutic responses. Prerequisite: PhyB 332.

500. Experimental Techniques in Pharmacokinetics and Pharmacodynamics. 3 Hours. Theoretical and practical aspects of research techniques and strategies used in pharmacokinetic and pharmacodynamic research with emphasis on the collection, preparation, and analysis of drugs in biological samples. Prerequisite: Consent of the instructor.

501. Laboratory Techniques in Pharmacokinetics and Pharmacodynamics. 2 to 4 Hours. Animals used in instruction. Laboratory experience in the basic research techniques of pharmacokinetics and pharmacodynamics. Prerequisite: Consent of the instructor.

520. Topics in Adverse Drug Reactions. 2 Hours. Advanced treatment of an announced or selected topic; intensive and critical evaluation of topic of current interest; emphasis on adverse reactions of special interest or issues related to adverse reactions. Requires written paper. Prerequisite: Consent of the instructor.

521. Receptors in Human Disease. 2 Hours. This course stresses the importance of receptors for neurotransmitters and hormones in the manifestation of various human disease states; emphasizes the treatment strategies based on the correction of the abnormalities in receptors. Prerequisite: Consent of the instructor.

523. Pharmacodynamics of Substance Abuse. 2 Hours. 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: Basic pharmacology and consent of the instructor.

525. Psychoneuroimmunology. 2 Hours. The interactions between the immune system, the endocrine system and the central nervous system (stress and immunity). Prerequisite: Admission to a graduate program in the health sciences.

541. Computer Techniques in Pharmacokinetics. 2 Hours. Applications of computers in pharmacokinetics. Principles necessary for understanding the operational possibilities, advantages and limitations of computers are discussed. Two lectures and one 3-hour laboratory per week. Prerequisite: PmPd 542 or consent of the instructor.

542. Advanced Pharmacokinetics. 3 Hours. Kinetics of absorption, distribution, metabolism and excretion of drugs, factors affecting these kinetics and their relationship to pharmacodynamics

will be discussed. Prerequisites: PmPd 400 and consent of the instructor.

561. Toxicokinetics. 2 Hours. Quantitation of the time course of absorption, distribution, biotransformation and excretion of intoxicants with special emphasis on the kinetics of overdoses, antidotes and accumulation. Prerequisite: Consent of instructor.

562. Immunotoxicology. 2 Hours. 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.

575. Forensic DNA Analysis. 3 Hours. Forensic DNA typing; isolation, quantitation; RFLP, Southern blot theory, methods, data handling, analysis; PCR theory, methods; population genetics; QA/QC, standardization; databases; reporting results; expert testimony. Prerequisites: PmPd 581 and consent of the director of graduate studies.

577. Microscopy of Botanical Traces. 2 Hours. Microscopical characterization of wood, pollen, spores, paper, fibers, and common botanical foodstuffs. Emphasis on forensic laboratory methods and evidence interpretation. Prerequisites: PmPd 585 and consent of the director of graduate studies.

578. Comparative Microscopy of Soils and Dust. 2 Hours. Microscopical characterization and comparison of soils and dust. Emphasis on inorganic components, systematic procedures, and forensic laboratory analysis and evidence interpretation. Prerequisites: PmPd 585 and consent of the director of graduate studies.

579. Forensic Examination of Building and Packaging Materials. 2 Hours. Microscopical characterization, identification, and comparison of glass paint, insulation materials, polymers and tapes. Emphasis on forensic laboratory methods and evidence interpretation. Prerequisite: PmPd 585 and consent of the director of graduate studies.

580. Forensic Science: Survey and Foundations. 3 Hours. Same as CrJ 580. Survey of the forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, and pattern evidence.

581. Forensic Analysis of Biological Evidence. 4 Hours. Same as CrJ 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 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. Same as CrJ 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 CrJ 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.

585. Chemical Microscopy and Ultramicroanalysis. 3 Hours. Same as CrJ 585. Critical application of chemistry and

## Pharmacodynamics (PmPd)

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the polarizing microscope to observe chemical reactions and characterize substances on microscale. Prerequisites: PmPd 582 and consent of the director of graduate studies.

586. Hair and Fiber Microscopy. 2 Hours. Microscopical characterization, identification and comparison of human and animal hair, man-made fibers and natural textile fibers. Emphasis on forensic laboratory methods and evidence interpretation. Prerequisite: PmPd 582 and consent of the director of graduate studies.

587. Medicolegal Identification and Investigation. 3 Hours. Same as CrJ 587 and Path 587. Survey of forensic medicine and medicolegal investigation; medical examiner, coroner systems of death investigation; wounds, patterns of injury, patterned injury; identification of human remains. Prerequisite: Consent of the director of graduate studies.

588. Microscopy of Illicit Drugs and Excipients. 2 Hours. Microscopical characterization of illicit drugs, commonly used cutting agents, contaminants and precursor materials. Characterization and profiling of products to evaluate commonality of source. Prerequisites: PmPd 585 and consent of the director of graduate studies.

589. Special Topics in Forensic Science. 3 Hours. Same as CrJ 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. Forensic Science Internship. 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 forensic science or toxicology laboratory or setting, under the supervision of a faculty member, with an accepted research project or paper required. Prerequisite: Consent of the instructor; PmPd 580; and a minimum of 15 hours of credit earned in the M.S. in Forensic Science program.

593. Research in Pharmacodynamics. 0 to 16 Hours. S/U grade only. Research in pharmacodynamics. Prerequisites: Consent of the instructor and the department head.

595. Departmental Seminar. 1 to 2 Hours. S/U grade only. May be repeated for credit. Departmental seminar.

596. Independent Study in Forensic Science. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research undertaken for this course may not duplicate that being done for PmPd 597 or 598. Supervised projects may consist of extensive reading or laboratory works or both, on topics not covered in regular course offerings. Prerequisite: Consent of the instructor and director of graduate studies.

597. Forensic Science Project Research. 3 Hours. S/U grade only. Supervised research in forensic science; a research project to be designed and completed within one semester. Prerequisites: PmPd 580, and at least the core course in the M.S. in Forensic Science program covering the subject area in which the research is to be conducted, e.g., PmPd 581, 582, 583 or 584.

598. M.S. Thesis Research. 0 to 16 Hours. 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 thesis research or writing. Prerequisite: Consent of the student's advisor; and acceptance of the thesis topic and preliminary thesis outline by the thesis committee.

599. Dissertation Research. 0 to 16 Hours. S/U grade only. Thesis research. Prerequisite: Consent of the thesis advisor.

## Pharmacognosy (PmPg)

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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.

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.

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. 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. S/U grade only. Research for students in the pharmacognosy doctoral program.

## Pharmacology (Pcol)

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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.

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. M.S. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under supervision of a graduate advisor.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under supervision of a graduate advisor.

## Pharmacy (Phar)

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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.

## Pharmacy Administration (PmAd)

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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.

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.

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 M.S. or Ph.D. 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. 2 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. Ph.D. 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.



## 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.

405. Philosophy of the Social Sciences. 4 Hours. Critical examination of important problems in the foundations of the social sciences; general methodological problems as well as problems arising from particular scientific theories. Prerequisite: Two courses 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.

434. Aesthetics. 4 Hours. Intensive examination of such topics as the aesthetic object, form in art, representation, meaning in art, art and knowledge. Prerequisite: One course in philosophy or consent of the instructor. Credit in Phil 107 is recommended.

437. Philosophy of Criminal Law. 4 Hours. Topics of relevance to criminal justice majors. Treatment of justice in criminal law systems. Source of obligation to obey the law, punishment, and rehabilitation. Prerequisite: One course in philosophy or consent of the instructor. Phil 103, 112, 230, 430, or 431 is recommended.

500. Writing in Philosophy. 4 Hours. Required of all first year Ph.D. 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.

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.

## Philosophy (Phil)

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506. Topics in the 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.

507. Seminar: 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.

511. 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.

512. 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.

513. Seminar on Philosophical Topics in Logic. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary.

515. Seminar on 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.

517. Seminar on the 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.

519. Seminar on the 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.

521. Seminar in the Theory of Knowledge. 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.

523. Seminar in 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.

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 Ph.D. 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 candidates' 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)

420. Pathophysiology. 3 Hours. Same as AHS 420. Introduction to medical management of disease processes. Fundamental pathologic processes in human diseases. Prerequisites: PhyB 341 and Anat 440 or the equivalent.
461. Physiology of Movement Dysfunction. 3 Hours. Advanced concepts of physiology and pathophysiology of movement. Includes muscle, cardiovascular, pulmonary and endocrine systems as they are involved in regulation of movement. Prerequisites: Any course in the elementary concepts of physiology, and any course in the elementary concepts of clinical pathophysiology, and consent of the instructor.
462. Neurology of Movement Dysfunction. 3 Hours. Neurologic concepts underlying PNS/CNS injury process and neural plasticity (nervous system remodeling and reorganization). Neuro-pathology and clinical courses of neurologic conditions producing movement dysfunction. Prerequisite: Consent of the instructor.
463. Measurement in Physical Therapy. 3 Hours. 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. Prerequisite: Any graduate-level statistics course and consent of the instructor.
470. Integrating Therapy into Multiple Environments. 3 Hours. Survey of various models for integrating motoric interventions into multiple environments, including home, community and classroom. Application of behavioral analysis to demands for child performance. 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 motor tests, test evaluation, interpretation of test scores, and application to clinical practice. Prerequisite: PT 463 or the equivalent, a graduate-level course in statistics, and consent of the instructor.
503. Analysis of the Development of Movement. 3 Hours. Sensorimotor development from fetus to old age, relating changes to maturation, motor learning and individual differences. Includes critical review of current literature. Prerequisite: Consent of the instructor, any course in elementary statistics and research design, and any course in human anatomy and physiology.
504. Assessment of Developmental Processes in Infancy. 2 Hours. Motor and behavioral competencies of the newborn, both term and preterm. Assessment of motor dysfunction in brain-damaged infants and analysis of the literature on intervention efficacy.
510. Neural Mechanisms of Normal and Abnormal Movement. 2 Hours. Critical analysis of how the nervous system produces functional movement and compensates for dysfunction of central motor centers. Application to posture and locomotion. Prerequisites: PT 462 and consent of the instructor.
511. Therapeutic Intervention. 3 Hours. Analysis of neurological dysfunction of select patient groups for the purpose of problem identification and development of strategies for measurement of that problem. Followed by application of selected intervention and measurement of resultant physical therapy outcome. Prerequisites: PT 462 and consent of the instructor.
519. Biomechanics of Normal and Abnormal Movement. 3 Hours. Same as Kine 571. Issues in motor control arising from statics and dynamics of the musculoskeletal system, such as kinematic redundancy, moment-arm variation, bone stress, stability, and intersegmental effects in multijoint movements. 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 460.
521. Biomechanics of Locomotor Dysfunction. 3 Hours. Review of developmental progression of walking pattern from birth to adulthood; neurological influences; kinematic and kinetic analysis of orthopedic and neurological deficits. Prerequisite: PT 460.
522. Instrumentation for Motion Analysis Research. 1 to 3 Hours. Introduction to motion analysis instrumentation for the study of locomotion. Equipment utilized in electromyography, kinematic, and kinetic analysis. Includes critical review of literature. Prerequisite: PT 460.
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; Schrodinger equation; mathematical structure of quantum mechanics; operators and observables; matrix representation of operators; three-dimensional Schrodinger equation. Prerequisites: Phys 215 and 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 I. 4 Hours. Same as EECS 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to Kinetic theory. Prerequisite: EECS 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.

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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in

the elementary or secondary school. 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 college or department of specialization.

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. Prerequisite: 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. Schrodinger 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.

## Physics (Phys)

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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 EECS 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: EECS 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-cular 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 Physiology: Health and Disease. 2 Hours. Same as Kine 523. Interrelationships between exercise and various pathological conditions. Current research relating exercise with coronary heart disease, hypertension, diabetes, uremia and obesity. 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 M.S. or Ph.D. 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. M.S. Thesis Research. 0-16 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 PoS 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.

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.

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.

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 Ph.D. 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 Ph.D. 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 Ph.D. 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.

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: interview-



## Policy Studies (PS)

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ing, participant observation, ethnography, case study, historiography. Topics vary. Prerequisite: Consent of the instructor.

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. Ph.D. 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 Ph.D. 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)

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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, deverbals, 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.

401. Data Analysis for Political Science I. 4 Hours. Same as PPA 401. Statistical inference for the social sciences. Emphasis on application and interpretation of statistics for interval data. Analysis of nominal and ordinal data.
402. Data Analysis for Political Science II. 4 Hours. Same as PPA 402. Applied multiple regression analysis for the social sciences and public policy. Regression specification and diagnostics. The relationship among multiple regression and other multivariate statistical methods. Prerequisite: PoIS 401.
404. Research Design for Political Science. 4 Hours. Introduction to research design and measurement theory in political science. Prerequisite: PoIS 402.
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 non-governmental 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. Prerequisite: 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: PoIS 200 or the equivalent or consent of the instructor.
471. Introduction to World Politics. 4 Hours. State-building and challenges to state authority, democratization and regime change, political economy, environment, war, regionalism and globalization, social movements and international governance.
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: PoIS 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: PoIS 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: PoIS 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 PoIS 598 or 599. Research on special problems not included in course offerings. Prerequisite: Consent of the instructor.
500. Introduction to Public Policy Analysis. 4 Hours. Same as PPA 500. Introduction to public policy analysis as practiced by four academic disciplines: economics, education, political science, and urban planning. Disciplinary assumptions, theoretical and applied research traditions.
502. Time Series Analysis for Political Science. 4 Hours. Single series (ARIMA) models, event history analysis, Vector autoregression (VAR), panel and pooled models. Prerequisite: PoIS 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: PoIS 402 or consent of the instructor.
536. Public Personnel Systems. 4 Hours. Major problems and issues in the management of human resources in the public sector. Prerequisite: PoIS 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: PoIS 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: PoIS 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

## Political Science (PoIS)

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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.

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: PoIS 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: PoIS 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: PoIS 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: PoIS 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.

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: PoIS 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.

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 Ph.D. 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 M.S. 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 M.S. in Oral Sciences program and consent of the department head.

## Psychiatric Nursing (NuPs)

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400. Dynamics of Small Groups. 2 Hours. Experiential study of group members' interrelationships and of predictable, systematic ways in which groups operate. Videotaped group life is observed and analyzed weekly.

450. Women and Mental Health Nursing. 3 Hours. Same as NuWH 450 and WS 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. Students enrolled in the College of Liberal Arts and Sciences must have credit in Psch 100, and either Psch 270 or Psch 315.

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.

506. Advanced Psychiatric Nursing Care of the Elderly. 3 Hours. Examination of major mental disorders among the elderly. Intervention based upon clinical assessment and research-based information. Emphasis on nursing roles. Prerequisite: Consent of the instructor.

521. Practicum in Advanced Psychiatric Nursing I. 3 Hours. Advanced psychiatric nursing assessment and management of psychiatric clients. Emphasis on psychiatric diagnostic formulations, functional assessment, case management, family and community resources. Prerequisite: Credit or concurrent registration in NuPs 500 or 502 or consent of the instructor.

522. Practicum in Advanced Psychiatric Nursing II. 3 to 6 Hours. Advanced psychiatric nursing practice with a selected caseload of psychiatric clients. Experiences with individuals, groups and families in psychiatric clinical settings. Prerequisite: NuPs 504 or 505, and 521.

541. 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.

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.

560. Minority Women's Health Nursing. 3 Hours. Same as NuWH 560. 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.

## Psychology (Psch)

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.

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. Prerequisite: Admission to the Ph.D. 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 I. 4 Hours. Probability theory; theoretical and empirical distributions; point and interval estimation; hypothesis testing; analysis of variance; bivariate and multiple regression analysis. Prerequisite: Graduate standing in psychology or consent of the instructor.

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: Graduate standing, or 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: Graduate standing, or 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:

Graduate standing, or 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: Graduate standing or 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: Graduate standing, or Psch 360 and 361 and consent of the instructor.

462. Advanced Physiological Psychology. 4 Hours. Anatomical and physiological substrates of behavior. Prerequisites: Graduate standing, or 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: Graduate standing, or 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: Graduate standing, or 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.



## Psychology (Psch)

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 Ph.D. in Education program or the Ph.D. 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.
521. Developmental Psychobiology. 3 Hours. Concepts and theory integrating behavioral and biological developmental processes, with examples from current research issues. Prerequisite: Consent of the instructor.
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 Ph.D. program in Education, Ph.D. program in Psychology, or Ph.D. 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. Theory, research, practice and evaluation of community interventions; types and effectiveness of community intervention; role of the community intervenor. Prerequisite: Consent of the instructor.
537. Seminar in Action Research. 3 Hours. May be repeated for credit. Satisfactory/unsatisfactory 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 Ph.D. 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. Advanced Statistics II. 4 Hours. Statistical analyses for experimental, quasi-experimental, and observational designs. Multiple regression and correlation, univariate and multivariate analyses of variance and covariance, discriminant analyses, covariance correlation, factor analysis and structural modeling. Prerequisite: Graduate standing in psychology or consent of the instructor.
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, multidimensional scaling, cluster analysis. Prerequisite: Psch 543.
547. Psychological Scaling. 3 Hours. Scaling theory and methodology with emphasis on measurement in psychophysics and social psychology. Prerequisite: Psch 443.
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

## Psychology (Psch)

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 Ph.D. in Education or the Ph.D. 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 Ph.D. 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 Ph.D. 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)

420. Public Administration Theory. 4 Hours. Theories of modern administrative behavior and organizational processes; major trends in research findings on organizational behavior and performance; comparison of governmental and non-governmental organization. Prerequisite: Admission to the MPA program or consent of the MPA director.

425. Organizational Analysis for Public Administration. 4 Hours. In-depth study of selected theoretical problems in administrative organizations; emphasis on political contexts and policy implications. Prerequisite: Admission to the MPA program or consent of the MPA director.

429. Public Administration and the Policy Process. 4 Hours. How political factors, institutional setting, procedures, and the prior experiences of government officials affect policy making and implementation. Policy evaluative techniques are discussed and applied. Prerequisite: Admission to the MPA program or consent of the MPA director.

435. 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 MPA director.

439. Field Experience in Public Administration. 6 Hours. Students work in an organization such as a government agency, community group, or nonprofit organization. Supplementing written work and guided group discussion required. Prerequisite: Admission to the MPA program or consent of the MPA director.

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 Ph.D. program in Public Administration or approval of the program director.

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 Ph.D. Program in Public Administration or approval of the program director.

506. Data Analysis for Public Administration I. 4 Hours. Statistical and research methods most commonly used by practitioners and researchers. Data collection and organization; probability; hypothesis testing; analysis of variance; correlation and regression. Prerequisite: Admission to the MPA program or consent of the MPA director.

507. The Economic Context of Public Administration. 4 Hours. Explores the economic factors which affect public administrators at the international, national, state, and local levels. Prerequisite: Admission to the MPA program or consent of the MPA director.

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 Ph.D. program in Public Administration or approval of the Program Director.

511. Financial Management in Public Service Organizations. 4 Hours. An examination of traditional and alternative sources of governmental funding, intergovernmental fiscal relationships, and the organization and management of the public finance function. Prerequisite: Admission to the MPA program or consent of the MPA director.

515. The Bureaucracy and the 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 Ph.D. program in Public Administration or approval of the program director.

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 Ph.D. program in Public Administration or approval of the program director.

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 Ph.D. program in Public Administration or approval of the program director.

530. Data Analysis for Public Administration II. 4 Hours. Builds on topics covered in PA 506. Includes coverage of bi-variate and multi-variate regression, non-parametric statistics, quasi-experimental design, and survey research. Prerequisites: PA 506 and admission to the MPA program or consent of the MPA director.

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 Ph.D. program in Public Administration or approval of the program director.

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 Ph.D. program in Public Administration or approval of the program director.

536. Personnel Issues in Public Administration. 4 Hours. Major problems and issues in the management of human resources in the public sector. Prerequisite: Admission to the MPA Program or consent of the MPA director.

537. The Legal Context 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: Admission to the MPA program or consent of the MPA director.

538. Budgeting for Public Administration. 4 Hours. Processes and methods of budgeting and program evaluation in public sector organizations. Analytical techniques, political influences, and budgetary reforms. Prerequisite: Admission to the MPA program or consent of the MPA director.

540. Research Design for Public Administration. 4 Hours. Logic and methods of quantitative and non-quantitative research in public administration. Issues in measurement; causal inference; experimental and quasi experimental designs; and methods of data collection. Prerequisite: Admission to the Ph.D. 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.

## Public Administration (PA)

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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 Ph.D. program in Public Administration or approval of the program director.

593. Independent Research in Public Administration. 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. Prerequisites: Approval of the Director of Graduate Studies and consent of the instructor.

594. Special Topics in Public Administration. 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 Ph.D. program in Public Administration 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. Prerequisite: Approval of the director of graduate studies and consent of the instructor.

599. Ph.D. 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 NuWH 455 and CHSc 456. 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 NuPH 517 or consent of the instructor.
520. Community Assessment and Program Planning in Public Health Nursing. 3 Hours. Explores theoretical and substantive issues related to the concepts of community assessment and health planning. Focuses on application of theories to public health nursing services. Prerequisite: NuSc 525 or the equivalent and Epid 400 or consent of the instructor.
521. Implementation and Evaluation of Public Health Nursing Services. 3 Hours. Concepts and methods of program implementation and evaluation. Development of an evaluation plan and critical analysis of evaluation studies. Applies nursing process to community health programs. Prerequisite: NuPH 520 or consent of the instructor.
522. Advanced Public Health Nursing Practice I. 3 Hours. Applies organizational and leadership theories and concepts to advanced public health nursing practice. Prerequisite: NuPH 400 or 402 or one graduate-level management course or consent of the instructor.
523. Advanced Public Health Nursing Practice II. 3 Hours. Emphasizes development of visionary leadership within public health nursing management practice including the concepts of entrepreneurship, intrapreneurship, and marketing. Prerequisite: NuPH 522.
524. Primary Care Nursing of Acute & Chronic Disorders I. 6 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. 3 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 3 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 NuWH 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique ongoing development and research. Prerequisite: Consent of the instructor.
570. International Dimensions in Women's Health. 3 Hours. Same as 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)

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401. Data Analysis for Political Science I. 4 Hours. Same as PolS 401. Statistical inference for the social sciences. Emphasis on application and interpretation of statistics for interval data. Analysis of nominal and ordinal data. Prerequisites: PolS 200 and 201 or graduate standing.

402. Data Analysis for Political Science II. 4 Hours. Same as PolS 402. Applied multiple regression analysis for the social sciences and public policy. Regression specification and diagnostics. The relationship among multiple regression and other multivariate statistical methods. Prerequisite: PPA 401.

500. Introduction to Public Policy Analysis. 4 Hours. Same as PolS 500. Introduction to public policy analysis as practiced by four academic disciplines: economics, political science, urban planning and education. Disciplinary assumptions, theoretical and applied research traditions.

540. Economics for Public Policy Analysis. 4 Hours. Same as Econ 540. May not be taken for credit by students with credit in Econ 501 or 520. Concepts of microeconomics applied to public policy analysis models of industrial choice, economic concepts of cost, basic theory of markets, economic behavior of public and nonprofit organizations.

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 Ph.D. 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 Ph.D. 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 Ph.D. 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. Prerequisite: Admission to the Ph.D. 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.



## Russian (Russ)

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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. Prerequisite: Consent of the instructor and the head of the department.

## Slavic (Slav)

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400. Introduction to Bibliography and Research. 4 Hours. Required of graduate students in Slavic studies. Detailed study of bibliographical and research tools applicable to Slavic studies. Prerequisite: Graduate standing or consent of the instructor.
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.
406. Foreign Language Computer-Assisted Instruction. 4 Hours. Same as Ger 406. Basic introduction to the use of computers in foreign language instruction. Each student must design and implement an instructional module as a term project. Prerequisite: Completion of the intermediate level, or the equivalent, in German, French, Spanish, or a Slavic language.
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. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experience, and approval of the college or department of specialization.
471. Educational Practice with Seminar II. 6 Hours. Graduate credit only with the approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.
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.
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. Ph.D. 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 Ph.D. 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)

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 Theory and Practice. 2 Hours. Models of couples and family treatment in widespread use today: communication/humanistic, psychodynamic, intergenerational, behavioral, structural, and strategic theory. Theories of interaction, engagement, assessment, interventions, and research on effectiveness for each model. Prerequisite: SocW 502.

504. Group Theory and Practice. 2 Hours. Basic elements of group dynamics. Special role of the social worker in groups with varied goals. Practice principles for use in all types of social work groups. Prerequisite: SocW 502.

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. 2 Hours. Intensive study of social work practice models used with children; presenting problems; phases of development; differential use of interventions; consultation with parents and significant support systems. Prerequisites: SocW 502 and 535.

513. Advanced Practice with Individuals. 2 Hours. Practice theory, technique, and research on advanced practice with individuals from an ego psychological point of view. Advanced skills in engagement, assessment, and treatment planning; interpretation and confrontation; racial and gender differences; transference and resistance; work with more disturbed clients; and evaluation of practice. Prerequisites: SocW 502 and 535.

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. 2 Hours. Engagement, study, assessment, and treatment of couples. Theory and research on couples treatment. Phases of couple treatment. Prerequisites: SocW 503 and 535.

517. Practice with Family Violence, Neglect, and Abuse. 2 Hours. An ecological approach to the phenomena of child neglect and violence against children and women. Differential use of

social work interventive strategies. Prerequisites: SocW 503 and 535.

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.

519. Cross-Cultural Practice. 2 Hours. Ethnocultural issues in practice. Cultural sensitivity in clinical practice with diverse ethnic/racial/cultural client populations. Prerequisites: SocW 502 and 537.

521. Aging: Theory and Practice. 2 Hours. Aging myths and stereotypes, demographic picture of the aged. Topics addressed: theories of aging; physical, social and psychological aspects of aging; aged women and minorities; pathologies in old age; services and resources; assessment, practice approaches; families, nursing and homes; and death and dying. Prerequisites: SocW 502 and 535.

522. Crisis Intervention and Suicide. 2 Hours. Models of crisis and emergency intervention, with special attention to suicide. Generic crisis intervention, predictable patterns of crisis response, and interventions designed for these patterns explored with special focus on women and minorities. Prerequisites: SocW 502 and 535.

523. Drug and Alcohol Abuse in Social Work Practice. 2 Hours. Characteristics and causes of alcohol and drug addiction. Contemporary approaches to intervening with the chemically dependent individual and family member. The impact of substance abuse on family, community, and work. Prerequisites: SocW 502 and 535, or consent of the instructor.

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. Practice Issues with Women. 2 Hours. History and theory of therapeutic treatment of women: analytic, feminist, behavioral, systems, structural, and educational. Relevant research. Impact of families on women and women on families. Prerequisites: SocW 502 and 535, 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.

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. Executive Leadership in Social Welfare. 2 Hours. Functions of executive leadership: strategic planning and resource acquisition; development/management of relationship between organization and environments; management of people and problems; development and maintenance of suitable organizational climate. Processes associated with exercise of executive thought, action, problem identification and resolution. Development of vision for the organization. Prerequisites: SocW 502 and 536, or consent of the instructor.

534. Independent Study in Practice. 2 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Independent study in practice area not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

535. Human Behavior and the Social Environment. 3 Hours. Human development from prenatal through late adulthood: physiological, social, and cultural influences on development.

## Social Work (SocW)

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. Psychopathology of Children and Adolescents. 2 Hours. Definition, characteristics, and etiologic factors of selected behavioral and psychiatric disorders of childhood and adolescence frequently encountered in social work practice. Emphasis on blocks and deviations in personality development. Prerequisite: SocW 535 or consent of the instructor.

540. Adult Psychopathology in Social Work. 2 Hours. Major psychopathologies of adulthood: schizophrenia, mood, anxiety, somatoform, substance use, borderline, narcissistic, and antisocial disorders. Differential diagnosis, etiology, and dynamics. Implications for social work. Prerequisite: SocW 535 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. 2 Hours. Theories of community violence with attention to race, class, and gender. Implications for social policy and social work practice. Prerequisite: SocW 536 or consent of the instructor.

545. HIV/AIDS: Challenges for Social Work. 2 Hours. Systems/ecological social work perspective on HIV/AIDS impact on society with focus on urban, at-risk groups. Psychosocial, cultural, medical, prevention, and intervention issues addressed. Prerequisites: SocW 502, SocW 535, and SocW 536; or consent of the instructor.

549. Independent Study in Human Behavior and the Social Environment. 2 to 4 Hours. May be repeated for a maximum of 8 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.

552. Child and Family Policy. 2 Hours. Domains of social policy that impact on children and families. Themes that connect the various domains are analyzed from a systems perspective in terms of policies and programs. Legislative actions, court decisions, theory, research, funding, and accountability. Prerequisite: SocW 550 or consent of the instructor.

553. Health Care Systems and Policies. 2 Hours. Conceptual and empirical framework as a basis for understanding health policies and programs from a social welfare perspective. Examination of social science concepts that expand knowledge base of policy and program issues. Emphasis on interests that shape health care delivery, and strategies and alliances used to better respond to needs of underserved groups. Prerequisite: SocW 550 or consent of the instructor.

554. Mental Health Policy. 2 Hours. Historical development of policies and the structure of mental health delivery systems. Policies and issues in Illinois are highlighted. Special focus on how policy affects care of the chronically mentally ill. Prerequisite: SocW 550 or consent of the instructor.

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. Social Welfare Policy Analysis. 2 Hours. Examines the content and the relative strengths and weaknesses of major theoretical models of social policy formulation and analysis. Selected models are used to analyze specific fields of social welfare services. Prerequisite: SocW 550 or consent of the instructor.

557. Women's Issues in Social Welfare Policy. 2 Hours. Same as WS 557. Social welfare consequences of gender discrimination utilizing several feminist perspectives; social class, race, ethnicity, and alternative sexual preference; historical significance of women in social welfare. Prerequisite: SocW 550 or consent of the instructor.

558. Social Work and the Law. 2 Hours. Legal procedures and issues of special relevance to social work practice. Legislation and court decisions on issues such as family development and crises, major social problems of racism, sex-based discrimination, poverty, education, and mental health; crime and delinquency; legal authority for social welfare programs, and regulation of social work practice. Prerequisite: SocW 550 or consent of the instructor.

559. Independent Study in Social Welfare Policy and Services. 2 to 4 Hours. May be repeated for a maximum of 8 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. Prerequisites: 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.

## Social Work (SocW)

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564. Clinical Practice Research. 3 Hours. Methodology of single-case research applied to practice with individual clients, couples, families, or groups in field settings. Includes the selection of change targets, ways to measure clinical change, ethical issues, single-case research designs, choice and verification of interventions, analysis of findings. Students plan and conduct a single-case study. 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. 2 to 4 Hours. May be repeated for a maximum of 8 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.

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.

590. Analysis of Social Work Treatment Models. 3 Hours. Historical development of social work treatment. Concepts and constructs analyzed through examination and critique of selected theoretical models. Values and ethics addressed. Prerequisite: Admission to the Ph.D. in Social Work program or consent of the instructor.

591. Social Welfare Policy Analysis and Development. 3 Hours. Common domain and key processes of social welfare policies; development of conceptual models and factors

affecting policy evolution; derivation of a framework for study; application of models to specific problems; implications for social and political action. Prerequisite: Admission to the Ph.D. in Social Work program or consent of the instructor.

592. Social Work Research Models and Knowledge Building. 3 Hours. The function of research in social work. Research methodologies for social work practice and policy. Knowledge-building processes and contribution of selected research models to the growth of knowledge examined. Prerequisite: Admission to the Ph.D. in Social Work program or consent of the instructor.

593. Quantitative Methods in Social Work Research. 3 Hours. Selected statistical procedures particularly important in social work research; applications to illustrative problems. Includes sampling and hypothesis-testing, nonparametric techniques, tests of association, and multivariate analysis. Prerequisite: Admission to the Ph.D. 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 Ph.D. 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 Ph.D. in Social Work program.

599. Ph.D. 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. Prerequisites: 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. Prerequisites: Soc 110 and graduate standing 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. Prerequisites: 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 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. Prerequisites: 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. Social Organization of National Economies. 4 Hours. Same as Mgmt 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 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. Prerequisite: 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:

site: 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. Undergraduates may take a maximum of 9 hours of credit. Students may register for more than one section per term. Extensive readings in specialized areas of sociology or empirical research for advanced undergraduate or graduate students. 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.

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.

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.



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.
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 department. Same as Ed 470. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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.
452. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. Same as Ed 471. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. 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 college or department of specialization.
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 LAsT 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.
501. Advanced Writing in Spanish. 4 Hours. May be repeated for a maximum of 8 hours of credit. Modern written Spanish. Grammar, stylistics and rhetoric of expository prose: norms, appropriateness, degrees of formality. Intensive practice. Prerequisite: 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 Spanish Applied Linguistics. 4 Hours. May be repeated for a maximum of 8 hours of credit. Past and current theoretical and empirical directions of the study of bilingualism and the acquisition of languages by bilingual speakers.

## Spanish (Span)

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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. M.A. 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. Ph.D. 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 Ph.D. 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. 1-4 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.

480. Technology and Multimedia: Learning Tools in the Classroom. 4 Hours. Same as CIE 480. New technologies to support teaching and learning in pre-college classrooms.

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.

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, or consent of the instructor.

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. Sys-

tems 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. Prerequisites: 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. Prerequisites: 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. Prerequisites: 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 Mental Retardation. 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 & 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. Prerequisite: 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. Prerequisites: SpEd 516.

521. Strategy Training for Mildly Handicapped Youth. 4 Hours. Assessment and instructional approaches to enhance student academic success in secondary content classrooms. Specific strategies for independent learning skills of mildly handicapped youth. Field experience. Prerequisite: SpEd 410 or consent of the instructor.

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 the community agency personnel. Prerequisite: SpEd 410 or equivalent, or consent of the instructor.

523. Teaching of Vocational and Social Skills for the Mildly Handicapped. 4 Hours. Training in assessment and teaching of vocational and related social skills necessary for decision making in elementary, secondary, postsecondary and work settings. Field experience. Prerequisite: SpEd 500 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,

## Special Education (SpEd)

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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 500, 424, and 426, and consent of the instructor one semester prior to registration. Applications are due two semesters in advance.

560. Administration of Programs for Students with Disabilities. 4 Hours. Same as PS 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. Prerequisites: SpEd 410 and CIE 551, or consent of the instructor.

561. Supervision of Special Education Programs and Services. 4 Hours. Examination of specific knowledge and skills necessary for the supervision of personnel responsible for the provision of direct services to exceptional learners. Field experience. Prerequisites: SpEd 410 and CIE 551, or consent of the instructor.

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 the Ph.D. program in Special Education.

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. Ph.D. 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 Non-Linear 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. Non-Cooperative 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.

## Statistics (Stat)

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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)

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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)

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423. Playwriting. 4 Hours. Same as Engl 495. The development of scripts for stage performance. Prerequisite: Consent of the instructor.

425. Modern American Theatre. 4 Hours. American theatre: producers, playwrights, directors, actors, designers, architects; 1914 to the present. Prerequisite: Thtr 209 or consent of the instructor.

441. Acting Shakespeare. 4 Hours. Speeches and scenes from Shakespeare, his predecessors, and successors.

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: 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: 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. Prerequisite: Thtr 255 and Thtr 256; or both Thtr 257 and Thtr 259; or consent of the instructor.

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: Thtr 161 or consent of the instructor.

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: Consent of the instructor.

472. Investigative Collaboration. 4 Hours. May be repeated for a maximum of 8 hours of credit. Collaboration as the primary means of theatrical creation. Production teams assigned to joint production projects. Topics vary. Prerequisite: Consent of the instructor.

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 4.00 grade point average 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. 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)

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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.
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: CEMM 403.
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 Geography 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. 1-4 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. 1-4 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.

## Urban Planning and Policy (UPP)

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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. 1-4 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. 1-4 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. Same as CEMM 513. 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. Same as CEMM 507. 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. Same as CEMM 506. 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. 1-4 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. Same as CEMM 503. 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. 1-8 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. 1-4 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.

## Urban Planning and Policy (UPP)

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596. Independent Study in Urban Planning and Policy. 1-4 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. 0-4 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. 0-16 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. Ph.D. Thesis Research. 0-16 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 Nursing (NuWH)

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450. Women and Mental Health Nursing. 3 Hours. Same as NuPs 450 and WS 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. Students enrolled in the College of Liberal Arts and Sciences must have credit in Psch 100, and either Psch 270 or Psch 315.

455. Women's Health: A Primary Health Care Approach. 3 Hours. Same as NuPH 455 and CHSc 456. 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. 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.

560. Minority Women's Health Nursing. 3 Hours. Same as NuPS 560. 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.

565. Advanced Research in Women's Health. 1 to 2 Hours. Same as NuWH 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique ongoing development and research. Prerequisite: Consent of the instructor.

570. International Dimensions in Women's Health. 3 Hours. Same as NuPH 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.

## 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. 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 Human Sexuality. 3 Hours. Same as CHSc 419. Human sexuality, family planning, and resulting social effects from a public health perspective.

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 women's studies courses or consent of the instructor.

439. Configurations of Femininity in German Literature. 4 Hours. Same as Ger 439. May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Lectures and discussion in English. Readings must be done in German for credit toward a degree in German. The portrayal of women in major works from the German literary tradition. Readings in the social, economic, intellectual, and religious background.

441. Introduction to Maternal and Child Health. 2 Hours. Same as CHSc 441. Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organizations for delivery of MCH services. Prerequisite: Consent of the instructor.

450. Women and Mental Health Nursing. 3 Hours. Same as NuWH 450 and NuPs 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. Students enrolled in the College of Liberal Arts and Sciences must have credit in Psch 100, and either Psch 270 or Psch 315.

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.

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 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.

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 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 Psch 315 and consent of the instructor.

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.

557. Women's Issues in Social Welfare Policy. 2 Hours. Same as SocW 557. Social welfare consequences of gender discrimination utilizing several feminist perspectives; social class, race, ethnicity, and alternative sexual preference; historical significance of women in social welfare. Prerequisite: SocW 550 or consent of the instructor.

594. Special Topics in 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 women's studies. Content varies. Prerequisite: Consent of the instructor or one course in 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.