

Rubrics

The following is a list of rubrics used for graduate courses. Please note that not all course rubrics currently list courses in the catalog.

| | | | |
|---|--------|--|--------|
| Accounting | (ACTG) | Electrical and Computer Engineering | (ECE) |
| Administrative Studies in Nursing..... | (NUAS) | Engineering | (ENGR) |
| African-American Studies | (AAS) | English | (ENGL) |
| Anatomy and Cell Biology | (ANAT) | English as a Second Language..... | (ESL) |
| Ancient Greek..... | (GKA) | Entrepreneurship..... | (ENTR) |
| Anthropology | (ANTH) | Environmental and Occupational Health Sciences.... | (EOHS) |
| Architecture..... | (ARCH) | Epidemiology..... | (EPID) |
| Art and Design..... | (AD) | Finance..... | (FIN) |
| Art History | (AH) | French | (FR) |
| Asian American Studies | (ASAM) | Gender and Women's Studies | (GWS) |
| Asian Studies | (ASST) | Geography..... | (GEOG) |
| Associated Health Sciences | (AHS) | Germanic Studies..... | (GER) |
| Biochemistry and Molecular Genetics..... | (BCMG) | Graduate College | (GC) |
| Bioengineering | (BIOE) | Graduate College—Life Sciences..... | (GCLS) |
| Biological Sciences..... | (BIOS) | Health Information Management..... | (HIM) |
| Biomedical and Health Information Sciences..... | (BHIS) | Health Policy and Administration | (HPA) |
| Biomedical Visualization | (BVIS) | Histology | (HSTL) |
| Biopharmaceutical Sciences | (BPS) | History | (HIST) |
| Biostatistics..... | (BSTT) | Honors College Courses..... | (HON) |
| Business Administration..... | (BA) | Human Nutrition..... | (HN) |
| Campus Courses..... | (CC) | Industrial Engineering..... | (IE) |
| Chemical Engineering..... | (CHE) | Information and Decision Sciences | (IDS) |
| Chemistry | (CHEM) | Information Technology | (IT) |
| Civil and Materials Engineering..... | (CME) | Interdisciplinary Public Health Sciences | (IPHS) |
| Classics | (CL) | Interdisciplinary Studies in the Arts | (ISA) |
| Committee on Institutional Cooperation..... | (CIC) | Italian | (ITAL) |
| Communication | (COMM) | Jewish Studies | (JST) |
| Community Health Sciences | (CHSC) | Latin | (LAT) |
| Computer Science..... | (CS) | Latin American and Latino Studies..... | (LALS) |
| Criminal Justice | (CRJ) | Liberal Arts and Sciences..... | (LAS) |
| Curriculum, Instruction, and Evaluation | (CIE) | Linguistics | (LING) |
| Disability and Human Development..... | (DHD) | Lithuanian | (LITH) |
| Disability Studies..... | (DIS) | Management..... | (MGMT) |
| Earth and Environmental Sciences..... | (EAES) | Marketing | (MKTG) |
| Economics..... | (ECON) | Master of Business Administration..... | (MBA) |
| Education..... | (ED) | Maternal-Child Nursing..... | (NUMC) |
| Educational Psychology..... | (EPSY) | Mathematical Computer Science..... | (MCS) |





| | | | |
|---|--------|---|--------|
| Mathematics | (MATH) | Public Administration | (PA) |
| Mathematics Teaching | (MTHT) | Public Health Nursing | (NUPH) |
| Mechanical Engineering | (ME) | Public Policy Analysis | (PPA) |
| Medical Biotechnology | (MBT) | Religious Studies | (RELS) |
| Medical Education | (MHPE) | Russian | (RUSS) |
| Medical Humanities | (MHUM) | Slavic and Baltic Languages and Literatures | (SLAV) |
| Medical Laboratory Sciences | (MLS) | Social Work | (SOCW) |
| Medical-Surgical Nursing | (NUMS) | Sociology | (SOC) |
| Medicinal Chemistry | (MDCH) | Spanish | (SPAN) |
| Medicinal Chemistry and Pharmacognosy | (PMMP) | Special Education | (SPED) |
| Microbiology and Immunology | (MIM) | Statistics | (STAT) |
| Movement Sciences | (MVSC) | Surgery | (SURG) |
| Music | (MUS) | Theatre | (THTR) |
| Native American Studies | (NAST) | Urban Planning and Policy | (UPP) |
| Natural Sciences | (NATS) | Women's Health Nursing | (NUWH) |
| Neuroscience | (NEUS) | | |
| Nursing Sciences | (NUSC) | | |
| Occupational Therapy | (OT) | | |
| Oral and Maxillofacial Surgery | (OSUR) | | |
| Oral Medicine and Diagnostic Sciences | (OMDS) | | |
| Oral Sciences | (OSCI) | | |
| Orthodontics | (ORTD) | | |
| Pathology | (PATH) | | |
| Pediatric Dentistry | (PEDD) | | |
| Pharmacognosy | (PMPG) | | |
| Pharmacology | (PCOL) | | |
| Pharmacy | (PHAR) | | |
| Pharmacy Administration | (PMAD) | | |
| Pharmacy Practice | (PMPR) | | |
| Philosophy | (PHIL) | | |
| Physical Therapy | (PT) | | |
| Physics | (PHYS) | | |
| Physiology and Biophysics | (PHYB) | | |
| Policy Studies | (PS) | | |
| Polish | (POL) | | |
| Political Science | (POLS) | | |
| Prosthodontics | (PROS) | | |
| Psychiatric Nursing | (NUPS) | | |
| Psychology | (PSCH) | | |

Accounting (ACTG)

417

Advanced Financial Accounting 3 OR 4 hours.

Financial accounting theory for business combinations, consolidated financial statements, international transactions and investments, and partnership accounting. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ACTG 316.

435

Auditing 4 hours.

Introduction to the audit function; ethical and legal environment; audit standards; objectives and procedures; materiality and audit risk; sampling; auditing in a computer environment; reporting. Extensive computer use required.

Prerequisite(s): ACTG 316.

445

Federal Income Tax I 3 OR 4 hours.

Concepts and provisions of federal income taxation as applicable to individual taxpayers, partnerships, individuals and trusts. 3 undergraduate hours. 4 graduate hours. Credit is not given for ACTG 445 if the student has credit for ACTG 508.

Extensive computer use required.

Prerequisite(s): ACTG 315.

446

Federal Income Tax II 3 OR 4 hours.

Concepts and provisions of federal income taxation on corporations and partnerships; special problems in reorganization, liquidations, and personal holding companies. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** ACTG 445 or the equivalent.

456

Business Law II 3 OR 4 hours.

Commercial law of partnerships, corporations, secured transactions, bankruptcy, real and personal property, wills and trusts, SEC regulations, unfair trade activities. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ACTG 355 or the equivalent.

465

Governmental and Nonprofit Accounting 3 OR 4 hours.

Financial transaction analysis and recording system; budget preparation and control; concepts and principles underlying the financial reports of governmental and nonprofit organizations. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ACTG 316.

474

Accounting Information Systems 3 OR 4 hours.

Skills and concepts that enable the documentation, design, and use of accounting information systems, understanding transaction cycles, sound internal controls, accounting software and the electronic business environment. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** Grade of C or better in ACTG 110 and Grade of C or better in ACTG 111; and IDS 100.

475

Database Accounting Systems 3 OR 4 hours.

Concepts and principles of designing database systems to perform accounting functions, applications of microcomputer accounting software packages systems design tools, and computerized transaction cycles. **Same as** IDS 475. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** ACTG 111 and IDS 100.

484

International Accounting 3 OR 4 hours.

Financial accounting for international operations, multinational managerial accounting and control, comparative international accounting, international reporting issues, and international taxation. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ACTG 316.

485

Valuation and Analysis 3 OR 4 hours.

Financial analysis and valuation of firms. Corporate strategies, financial reporting issues, and market perceptions. 3 undergraduate hours. 4 graduate hours. Extensive computer use required.

Prerequisite(s): ACTG 315 and FIN 300 for undergraduate students. One accounting and one finance class or consent of the instructor for graduate students.

494

Special Topics in Accounting 1 TO 4 hours.

Topics rotate in various areas of accounting, including but not restricted to financial, managerial, governmental and nonprofit accounting, law and business ethics. Explores current issues and proposed alternatives.

Prerequisite(s): Two courses in accounting or finance beyond ACTG 111 and FIN 300 or the equivalent.

495

Competitive Strategy 4 hours.

Multidisciplinary analysis of organization strategy and policy, using case method, and/or business simulation. Assignments involve extensive library research and oral and written reports. **Prerequisite(s):** Senior standing in the College of Business Administration and completion of all other CBA core courses, or consent of the instructor.

500

Introduction to Financial Accounting 4 hours.

Concepts and principles of financial accounting for preparation and evaluation of external reports and financial statements. Credit is not given for ACTG 500 if the student has credit for MBA 501. Extensive computer use required. **Prerequisite(s):** Admission to the MBA or MS in Accounting or Master of Healthcare Administration 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(s): 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. **Prerequisite(s):** ACTG 500 and ACTG 502 or the equivalents.

506

Management Accounting 4 hours.

Design of cost accounting systems; alternate costing methods; costing for decision making; and budget planning and performance evaluation. **Prerequisite(s):** ACTG 500.

508

Federal Income Tax—Graduate 4 hours.

Concepts and provisions of federal income taxation generally applicable to individual taxpayers, corporations, and partnerships. Credit is not given for ACTG 508 if the student has credit for ACTG 445.

Prerequisite(s): ACTG 500.

509

Business Law—Graduate 4 hours.

Commercial law of contracts, sales, commercial paper, agency,

suretyship, insurance law, and liability of management.

Prerequisite(s): 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(s): ACTG 503 or the equivalent.

516

Financial Statement Analysis 4 hours.

Use of financial information by decision makers external to the firm; profitability and risk analysis; financial forecasting and equity valuation. Extensive computer use required. **Prerequisite(s):** ACTG 502; or approval of the department.

525

Management Control of Strategic Performance 4 hours.

Contemporary overview of the management control systems measuring technological activities, measuring value added, outsourcing noncore compensation plan and performance measurement. Extensive computer use required.

Prerequisite(s): ACTG 506; or approval of the department.

535

Advanced Auditing 4 hours.

Review and evaluation of academic research in auditing behavioral and capital market research. Overview of audit research methodology, examination of Sarbanes-Oxley and its effect on Internal Controls, auditing standards, and the accounting profession. Extensive computer use required. **Prerequisite(s):** ACTG 435.

537

Fraud Examination 4 hours.

Concepts and skills necessary for examining financial fraud. Content will include fraud schemes, prevention and detection of fraud, ethics, forensic software tools, auditing techniques, and the law and regulations governing fraud cases. Extensive computer use required. **Prerequisite(s):** ACTG 474 and ACTG 502 or equivalents.

545

Taxes and Business Policy 4 hours.

The role of taxes in business decisions. Emphasizes integrating taxes with other variables—behavioral, financial, environmen-



tal, and others. Also discusses the relationship between taxation and financial and managerial accounting. **Prerequisite(s):** ACTG 345 and ACTG 446.

565

Advanced Government and Nonprofit Accounting 4 hours.

Financial accounting principles applicable to governments and nonprofit organizations.

Transactions and events are analyzed, leading to the preparation and analysis of financial statements. **Prerequisite(s):** ACTG 503 or equivalent.

585

Corporate Valuation and Accounting Information 4 hours.

Valuation using discounted cash flow and multiples. Use of financial disclosures to construct forecasts. How multiples behave. How accounting affects valuation ratios. Credit is not given for ACTG 585 if the student has credit for ACTG 485.

Prerequisite(s): ACTG 502; and FIN 510 or FIN 520; or approval of the department.

590

Case-Based Research in Accounting 4 hours.

Development of skills necessary to research and interpret accounting standards and guidelines to resolve recognition and disclosure issues using real-life and simulated cases. **Prerequisite(s):** ACTG 503 or equivalent.

593

Accounting Research: Methodology and Communication 4 hours.

Instruction in research methods, issues, and research appreciation and evaluation together with individual practice in planning, conducting, and reporting professional research projects in accounting and capital markets. Extensive computer use required.

Prerequisite(s): ACTG 502.

594

Special Topics in Accounting—Graduate 1 TO 4 hours.

Topics rotate in the various areas of accounting, including but not restricted to financial, managerial, governmental and nonprofit accounting, explores current issues and proposed alternatives. May be repeated. Students may register in more than one section per term. Extensive computer use required. **Prerequisite(s):** 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. **Prerequisite(s):** ACTG 515 and ACTG 525.

599

PhD Thesis Research 0 TO 16 hours.

Research on topic of the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Faculty acceptance of thesis proposal.

Administrative Studies in Nursing (NUAS)

501

Administrative Nursing Models 2 hours.

Appraisal and synthesis of theory, research, and practice in the organization and management of the delivery of nursing and health-care services, including currently used models of nursing care delivery. **Prerequisite(s):** Consent of the instructor.

502

Strategic Management in Healthcare 3 hours.

Examines the essentials of strategic management. An analysis of current and future trends and issues affecting healthcare are reviewed in the context of visioning, strategic planning, and tactical planning. **Prerequisite(s):** Consent of the instructor.

505

Nursing Systems Operations Management 3 hours.

Nursing systems operations management of health services. Examines the managerial role at individual, program, work unit, department, and organizational levels. Includes focus on interaction of the organization and environment. **Same as** NUPH 505. **Prerequisite(s):** Consent of the instructor.

512

Healthcare Human Resources Management 3 hours.

Focuses on the development of a strategic human resource plan to support the mission of the health-care organization. Current human

resources management and organizational performance research findings are explored. **Same as** NUPH 512. **Prerequisite(s):** NUAS 505 or NUPH 505.

515

Advanced Nursing Management in Community-Focused Health Services 3 hours.

Theory and research in leadership, management, and community-focused assessment for advanced nursing practice in complex and integrated health systems. **Same as** NUPH 515. **Prerequisite(s):** NUSC 528 or consent of the instructor.

516

Evaluation of Health Services Outcomes for Nursing 3 hours.

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. **Same as** NUPH 516. **Prerequisite(s):** NUAS 515 or NUPH 515 or consent of the instructor.

517

Budget and Finance of Health and Nursing Services 3 hours.

Financial management techniques, supply and demand, cost behaviors, revenue sources, provider reimbursement, and public and private health insurance for health and nursing services will be analyzed. **Same as** NUPH 517. **Prerequisite(s):** NUAS 505 or NUPH 505.

520

Internship in Advanced Nursing 1 TO 3 hours.

Intensive field study for advanced nursing practice with emphasis on integration of graduate course work. **Same as** NUPH 520. May be repeated. **Prerequisite(s):** Consent of the instructor.

African-American Studies (AAST)

410

Seminar in Black Child Development 3 OR 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. 3

undergraduate hours. 4 graduate hours. **Prerequisite(s):** AAST 201 or PSCH 100 or consent of instructor.

441

Topics in African History 3 OR 4 hours.

Specific topics are announced each term. **Same as** HIST 441. 3 undergraduate hours. 4 graduate hours. May be repeated. **Prerequisite(s):** 3 hours of African history, African-American studies, or consent of the instructor.

445

History of Islam in the African World 3 OR 4 hours.

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. **Same as** HIST 445. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Consent of the instructor.

470

Reading Black Women Writing 3 OR 4 hours.

Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. **Same as** ENGL 480 and GWS 470. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** AAST 350 or AAST 351 or AAST 355 or AAST 357 or AAST 360; or ENGL 350 or ENGL 351 or ENGL 355 or ENGL 361 or ENGL 363; or consent of the instructor.

481

Topics in African-American History 3 OR 4 hours.

African-American history for students with significant background in the field. Topics vary. **Same as** HIST 485. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. Students may register in more than one section per term. **Prerequisite(s):** AAST 247 or AAST 248 or HIST 104 or HIST 247 or HIST 248 or consent of the instructor.

490

Topics in African-American Literature 3 OR 4 hours.

African-American literature and culture for students with significant background in the field. Topics vary. **Same as** ENGL 473. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** AAST 357 or



AAST 360 or ENGL 357; and senior standing or above; or consent of the instructor.

492
Topics in Social Science Research

3 OR 4 hours. Inclusive examination of a selected specialized topic based on instructor's field. Topics are drawn from research in political science, psychology, sociology, and history. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. Students may register in more than one section per term. **Prerequisite(s):** AAST 100 or consent of the instructor.

496
Topics in Race, Ethnic and Minority History

3 OR 4 hours. Specific topics are announced each term. **Same as** HIST 496. 3 undergraduate hours. 4 graduate hours. May be repeated. **Prerequisite(s):** 3 hours of history or consent of the instructor.

Anatomy and Cell Biology (ANAT)

403
Human Neuroanatomy **3 hours.** Morphological organization of the nervous system. Functional correlations of neural structures. **Same as** NEUS 403. Meets eight weeks of the semester. **Prerequisite(s):** Graduate standing and consent of the instructor. Must be in a degree program.

414
Neuroanatomy for Allied Health Program **3 hours.** Basic development and gross features of the central nervous system and systems neuroanatomy; motor, sensory, and integrative functional areas.

439
Gross Human Anatomy I **5 hours.** Functional and structural anatomy and embryology of the body. **Prerequisite(s):** Graduate standing and consent of the instructor.

440
Gross Human Anatomy II **2 hours.** Gross morphology and function of the human body. **Prerequisite(s):** Graduate standing and ANAT 439; or consent of the instructor.

441
Gross Human Anatomy **5 hours.** Functional and structural anatomy of the body. For allied health stu-

dents. **Prerequisite(s):** Graduate standing and consent of the instructor; or enrollment in the Doctor of Physical Therapy program or MS in Biomedical Visualization program.

442
Cell Structure and Human Histology **5 hours.** Structure and function of cells and fundamental tissues. Function and microscopic anatomy of organs. **Prerequisite(s):** Graduate standing and consent of the instructor.

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(s):** 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(s):** ANAT 403 or consent of instructor.

523
Biology of MicroRNAs and other Small RNAs **2 hours.** History overview, and biology of small RNA pathways, including microRNAs, siRNAs, RNA interference, roles in various biological processes, implication in disease pathophysiology and potential therapies. Satisfactory/Unsatisfactory grading only.

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. **Same as** BIOS 527. **Prerequisite(s):** Credit in one neuroscience course or consent of the instructor.

544
Advanced Craniofacial Anatomy **3 hours.** Functional and clinical aspects of head and neck anatomy, based on detailed laboratory dissection, original readings, and project work. **Prerequisite(s):** 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(s):** ANAT 403 or the equivalent.

560
Practicum in the Teaching of Anatomy **1 hour.** Provides an opportunity for supervised discussion and evaluation of materials and methods in teaching the basic anatomical sciences. Satisfactory/Unsatisfactory grading only. May be repeated. No graduation credit. For anatomy and cell biology teaching assistants. **Prerequisite(s):** Consent of the instructor.

585
Cell Biology **4 hours.** Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. **Same as** MIM 585 and PHYB 585.

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. **Same as** BIOS 586. **Prerequisite(s):** BIOS 442 or consent of the instructor.

595
Department Seminar **1 hour.** 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. Satisfactory/Unsatisfactory grading only.

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.** Thesis research under the direction of a faculty member. Satisfactory/Unsatisfactory grading only.

599
Research in Anatomy **0 TO 16 hours.** Independent research, directed by a faculty member. Satisfactory/Unsatisfactory grading only.

Ancient Greek (GKA)

498
Advanced Topics in Ancient Greek Literature **3 OR 4 hours.** Intensive reading of ancient Greek literature. Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 9 hours. Students may register in more than one section per term. **Prerequisite(s):** 4 hours of ancient Greek at the 200-level or the equivalent.

499
Independent Reading **3 OR 4 hours.** Individual study under faculty direction. For students qualified by preparation and interest. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 4 hours of ancient Greek at the 200-level or the equivalent.

Anthropology (ANTH)

401
Linguistic Anthropology **3 OR 4 hours.** Exploration of the relationship between language and culture in a cross-cultural perspective. Attention to methods of field research as well as theory and substantive issues. Course information: 3 undergraduate hours. 4 graduate hours.

405
Human Growth and Nutrition **3 hours.** Worldwide variation in human growth and the factors that contribute to differences between populations and individuals in the timing and pattern of growth and development. **Same as** EPID 405.

409
Ancient Maya Writing, Language, and Culture **3 OR 4 hours.** Recent trends in Maya epigraphy, information gained from Maya hieroglyphs, linguistics, and historical ethnographies are applied to anthropological analyses of past lifeways. **Same as** LALS 409. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

411
Urban Cultural Problems **3 OR 4 hours.** A study of the processes of urbanization and of cultural and social adjustments to the city; illustrated by case studies. 3 undergraduate hours. 4 graduate hours.



413
Social Organization 3 OR 4 hours.
Theory and method in the study of kinship and social organization, for advanced undergraduate and graduate students. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): ANTH 213 or graduate standing or consent of the instructor.

414
Symbolic Anthropology 3 OR 4 hours.
The interpretation of cultures through their ritual, religions, culture, and other types of symbolism. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 101 or consent of the instructor.

415
Medical Anthropology 3 OR 4 hours.
Survey of the history of non-Western medicine; analysis of ecological relationships behind folk medicine; principles and methods of studying ethnomedicine. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): ANTH 200 or consent of the instructor.

417
Marxist Approaches to Anthropology 3 OR 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. 3 undergraduate hours. 4 graduate hours.

418
Ethnographic and Qualitative Research Methods 3 OR 4 hours.
Practical introduction to the techniques of social scientists for research in natural social settings: participant observation/non-participant observation, interviewing, use of documentary sources, etc. **Same as** GEOG 418. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): Junior standing or above.

420
Seminar in Archaeology and Ethnography 3 OR 4 hours.
Case studies of investigations in archeology using research monographs and other primary sources. Substantive data and related theoretical problems are examined simultaneously. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 15 hours. **Prerequisite(s):** Junior standing or consent of the instructor.

421
Geomorphology and Archaeology 3 OR 4 hours.
Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geoarchaeology. **Same as** GEOG 432. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 131 or EAES 101 or consent of the instructor.

422
Prehistory of the Levant and the Nile Valley 3 OR 4 hours.
Detailed analysis of Levantine and Nile Valley prehistory during the Pleistocene and early Holocene. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 221 or ANTH 222 or consent of the instructor.

423
Andean Prehistory 3 OR 4 hours.
An overview of the cultural evolution of the Andean region from the arrival of the first inhabitants to the development of the Inca empire. **Same as** LALS 423. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): ANTH 228 or ANTH 269; or consent of the instructor.

424
Violence 3 OR 4 hours.
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. **Same as** CRJ 423. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CRJ 101 and CRJ 200.

425
Field Techniques in Archaeology 4 hours.
Exposure to field methods in archaeology through participation in an actual research project. Students are instructed in field excavation techniques. Usually offered in summer session. **Same as** GEOG 425. May be repeated to a maximum of 8 hours. **Prerequisite(s):** ANTH 102 or consent of the instructor.
Recommended: Concurrent registration in ANTH 426 or GEOG 426.

426
Laboratory Techniques in Archaeology 4 hours.
Exposes students to laboratory methods in archaeology through the analysis of excavated materials. Students are instructed in laboratory

techniques. **Same as** GEOG 426. May be repeated to a maximum of 8 hours. **Prerequisite(s):** ANTH 102 or consent of the instructor.
Recommended: Concurrent registration in ANTH 425 or GEOG 425.

427
Theory and Application in Ethnoarchaeology 3 OR 4 hours.
Focuses on the application of scientific experimentation and ethnographic information to enhance our understanding of the archaeological record, material culture, and past human behavior. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One 100- or 200-level archaeology course; or graduate standing and consent of the instructor.

428
Chiefdoms 3 OR 4 hours.
Focus on traditional nonstate, yet complex, societies known as "chiefdoms." Examine the organization and evolution of such societies through a combination of ethnographic, historical, and archaeological data. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): ANTH 101 or ANTH 102; or consent of the instructor.

429
Archaeological Methods 3 OR 4 hours.
This course will familiarize students with various methodologies used by archaeologists and geoarchaeologists. Course will concentrate on a different method each time it is taught. Course information: **Same as** GEOG 429. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. Students may register for more than one section per term.

430
Seminar in Primate Biology 4 OR 5 hours.
Theoretical and substantive issues in the study of nonhuman primates and hominids, as represented in current journals and topical volumes. 4 undergraduate hours. 5 graduate hours.

437
Bioarchaeology 5 hours.
Provides an overview of mortuary theory and the bioarchaeological methods used to study health and disease, diet, activity patterns, kinship, and cultural practices in archaeological populations. **Prerequisite(s):** Grade of B or better in ANTH 237 and consent of the instructor.

440
The Experience of Culture Difference: Culture Shock 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): One course in social or cultural anthropology, or experience in another culture.

441
Psychoanalytic Anthropology I: Cross-Cultural Theory 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): One course in anthropology or psychology, or consent of the instructor.

442
Psychoanalytic Anthropology II: Cross-Cultural Applications 3 OR 4 hours.
Explores ways in which anthropologists and analysts have used psychoanalysis to understand individuals, practices, and institutions of other cultures. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): ANTH 441 or consent of the instructor.

443
Leadership: Psychology, Strategy, Culture 3 OR 4 hours.
Psychological and anthropological theories of leadership developed on our culture will be tested against descriptions of leadership in diverse non-Western societies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One course in anthropology.

444
Dreams, Dreaming, and Dream Beliefs 3 OR 4 hours.
The dreaming experience examined from the point of view of psychological interpretation, laboratory experiments, and anthropological study of dreams in other cultures. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One course in anthropology or psychology and junior or senior standing, or consent of the instructor.

453 Seminar in Cultural Ecology 3 OR 4 hours.
Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture. **Same as** GEOG 453. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 101 or GEOG 151 or consent of the instructor.

455 Quantitative Methods 3 OR 4 hours.
Introductory statistics course in statistical methods for anthropological problem-solving. Primary emphasis is on univariate and bivariate statistics, such as means standard deviations, correlation, chi square, t-tests, and simple regressions. **Same as** GEOG 455. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

470 Classic Ethnographies 3 OR 4 hours.
Analysis of method and theory reflected in selected classic anthropological works, studied in their historical contexts and contemporary uses. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 101 or ANTH 213 or consent of the instructor.

474 Urban Cultures of Africa 3 OR 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. 3 undergraduate hours. 4 graduate hours.

475 Indians of the Andes and the Amazon 3 OR 4 hours.
Intensive research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given to Levi-Strauss' ideas on the formulation of cultural theory in South America. **Same as** LALS 475. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 213 or consent of the instructor.

476 Rise and Fall of the Inca Empire 3 hours.
Using an integration of ethnographic, historical, and archaeological information, this course is designed to provide a thorough introduction to the study of the Incas. **Prerequisite(s):** Sophomore standing or above.

477 Remote Sensing of the Environment 4 hours.
Principles and practices of processing and interpretation of remotely sensed imagery, including aerial photographs, radar, and multispectral satellite images. Hands-on use of image-processing software. **Same as** GEOG 477. Extensive computer use required.

479 Culture and Colonialism in South Asia 3 OR 4 hours.
Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the eighteenth century to 1947. **Same as** ASST 479 and HIST 479. 3 undergraduate hours. 4 graduate hours.

480 Sociolinguistics 3 OR 4 hours.
Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. **Same as** LING 480. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** LING 405 or junior standing and consent of the instructor.

481 Geographic Information Systems I 4 hours.
Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files. Geocoding. **Same as** GEOG 481. **Prerequisite(s):** GEOG 100 and one from GEOG 278, GEOG 386, IDS 100; or consent of the instructor.

482 Geographic Information Systems II 4 hours.
Application of raster- (or grid-) based geographic information systems to the spatial analysis of landscapes. **Same as** GEOG 482.

483 Geographic Information Systems III 4 hours.
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. **Same as** GEOG 483. **Prerequisite(s):** GEOG 482 or ANTH 482 or consent of the instructor.

484 Mapping with Microcomputers 4 hours.
Microcomputer applications, including computer principles for mapping, alternative design for coordinate files, kinds of devices for mapping, direct control of devices for mapping, and characteristics and limitations of mapping programs. **Same as** GEOG 478. **Prerequisite(s):** GEOG 475 or consent of the instructor.

485 Computer Cartography 4 hours.
The fundamentals of cartography and cartographic design. The use of state-of-the-art, Windows-based computer mapping software for querying and displaying cartographic data contained in GIS databases. **Same as** GEOG 485.

490 Independent Study 1 TO 6 hours.
Independent reading under the supervision of a faculty member. May be repeated to a maximum of 8 hours with approval. Students may register in more than one section per term. **Prerequisite(s):** Junior standing and consent of the instructor.

494 Special Topics in Anthropology 3 TO 4 hours.
Reading, study, and discussion of selected problems for graduate students and majors in anthropology. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Junior standing or approval of the department.

496 Internship 1 TO 4 hours.
Professional field experience with an agency or organization in the private or public sector on projects related to the student's area of specialization. **Same as** GEOG 496. May be repeated to a maximum of 8 hours. Only 4 hours of credit may be applied toward the minor in Geography. **Prerequisite(s):** Declared major in Anthropology, minor in Geography, or full graduate stand-

ing in Anthropology or Geography and consent of the faculty adviser, head of the department, or the director of internship programs.

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(s):** 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 genealogical relationships of species; interpretation of adaptations of extinct species in an evolutionary context.

510 Seminar in Social Organization 4 hours.
Theoretical and substantive issues about how societies are organized. **Same as** GEOG 510. May be repeated to a maximum of 12 hours.

514 Gender Issues in Cross-Cultural Perspectives 4 hours.
Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. **Same as** GWS 514. **Prerequisite(s):** ANTH 500 or consent of the instructor.

520 Seminar in Archaeological Theory and Method 4 hours.
Theoretical and substantive issues in the study of prehistory and the recovery and interpretation of the archaeological record. May be repeated. **Prerequisite(s):** ANTH 502 or consent of the instructor.

521 Analysis of Stone Artifacts 4 hours.
Analyzing stone objects.





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. May be repeated. Students may register in more than one section per term.

531 Anthropological Genetics 4 hours.
Basic overview of genetic theory and techniques, followed by a survey of the contributions of human genetics to human adaptation and evolution.

Prerequisite(s): Grade of B or better in ANTH 508 or grade of B or better in BIOS 220; or consent of the instructor.

532 Advances in Ancient DNA 4 hours.
Basic techniques and special concerns in the application of molecular biology techniques to the study of ancient DNA, followed by a discussion of recent advances and contributions to the field.

Prerequisite(s): Grade of B or better in ANTH 531 or grade of B or better in BIOS 220.

533 Lab Methods for Ancient DNA 2 hours.
Provides students with laboratory training in molecular biology techniques commonly used in studies of ancient DNA. **Prerequisite(s):** Consent of the instructor.

534 Dental and Medical Anthropology Within Human Evolution 1 TO 3 hours.
Studies the biological and physical anthropology of hominid teeth and the craniofacial complex with relevant medical anthropology, ethnopharmacology, forensic sciences, and paleopathology topics. **Same as** OSCI 534 and PMPG 534. Field work required. A lab experience, independent study, and a research paper is required for 3 hours of credit. **Prerequisite(s):** Graduate standing and consent of the instructor.

570 Regional Application of Anthropology 4 hours.
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. May be repeated.

594 Special Topics in Anthropology 4 hours.
Study of a selected topic in anthropology. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

595 Graduate Seminar in Anthropology 1 hour.
Presentations of current research by faculty followed by student discussion. Course is to be taken during student's first year in the graduate program as one of the core courses. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Admission to the graduate program in Anthropology.

596 Independent Study 2 TO 6 hours.
Independent research is done under the supervision of a faculty member. May be repeated to a maximum of 12 hours with approval. Students may register in more than one section per term. Approval to repeat course granted by the department.

Prerequisite(s): Consent of the instructor.

597 Project Research 2 TO 6 hours.
The student will do an independent research project with the aid of a faculty adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

599 PhD Thesis Research 0 TO 16 hours.
Research on doctoral dissertation topic. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Advancement to candidacy for the PhD in Anthropology.

Architecture (ARCH)

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(s):** Graduate standing in the Master of Architecture 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.

Prerequisite(s): ARCH 410 and graduate standing in the Master of Architecture program.

412 Women and the Environment 3 OR 4 hours.
Women's place in the built environment; the role of gender in environmental experience, including women as users, designers, planners, policy makers, and critics. **Same as** GWS 412. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Advanced undergraduate or graduate standing, or consent of the instructor.

414 Professional Practices 3 hours.
Relationship of the discipline of architecture to the profession. Exposure to interdisciplinary studies that may lead to alternative careers in allied businesses and professions. **Prerequisite(s):** ARCH 252 and approval of the department.

415 Architectural Design Lecture III 2 hours.
Examination of the relationship of architecture to society, technological change, and structural and environmental innovation. **Prerequisite(s):** ARCH 307 and ARCH 308; and approval of the school. Must enroll concurrently in ARCH 416.

416 Architectural Design Laboratory III 4 hours.
Laboratory component of ARCH 415. **Prerequisite(s):** ARCH 307 and ARCH 308; and approval of the school. Must enroll concurrently in ARCH 415.

417 Architectural Design Lecture IV 2 hours.
Diverse topics in architecture and interdisciplinary practices; design problems representing areas of specialized interest within and allied to the practice of architecture. **Prerequisite(s):** ARCH 415. Must enroll concurrently in ARCH 418.

418 Architectural Design Laboratory IV 4 hours.
Laboratory component of ARCH 417. **Prerequisite(s):** ARCH 416. Must enroll concurrently in ARCH 417.

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(s):** Graduate standing in the Master of Architecture 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(s):** Completion of the second plateau or approval of the school.

444 Professional Practice II 2 hours.
Business and financial considerations in architectural practice, scope of services, and communications and marketing guidelines. Interrelationship with clients, consultants, collaborators, and the manufacturing and construction industry. **Prerequisite(s):** ARCH 443 and approval of the school.

465 Capstone Studio 6 hours.
Capstone senior design studio that culminates in a comprehensive project that explores the relationship of architecture to society, technological change, and structural and environmental innovation. Extensive computer use required. Field trip required at a nominal fee. Fieldwork required. Students will use city as a research laboratory with fieldwork on project sites. Additional scheduled field trips will be made to significant or historical architectural buildings as part of preliminary design research and analysis. **Prerequisite(s):** ARCH 360 and ARCH 366 and ARCH 372 and junior standing or above and approval of the department.

466 Option Studio 6 hours.
Topic options studio that culminates B. Arts studio sequent exploring topics at the scale of room, building, city, and region dependent on interests of faculty. Extensive computer use required.

Field trip required at a nominal fee. Fieldwork required. Students will use city as a research laboratory with fieldwork on project sites. Additional scheduled field trips will be made to significant or historical architectural buildings as part of preliminary design research and analysis. **Prerequisite(s):** ARCH 465 and approval of the department.

470

Structures I: Structural Analysis 4 hours.

Introduction to the analysis of structural elements. Introduction to fundamental structural planning criteria and relevant concepts of tension, compression, and bending. Introduction to historical and contemporary structural precedents. **Prerequisite(s):** MATH 180 and PHYS 105 and PHYS 106.

471

Structures II 3 hours.

Introduction to material properties, strength characteristics of building materials and material assemblies, stress and strain, rigidity and deformation, temperature effects, torsion effects, and combined loading of elements and systems. **Prerequisite(s):** ARCH 470 and approval of the school.

486

Urban Ecologies and Infrastructures 4 hours.

Introduction to dynamic relationship of ecology and infrastructure in the context of contemporary urban landscape. Built and natural environments as inseparable networks of a dynamic process. **Prerequisite(s):** Graduate standing in the Master of Architecture program or, for students in the Bachelor of Arts in Architectural Studies program, consent of the instructor.

494

Special Topics in Architecture 2 TO 4 hours.

Current problems. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** 12 hours of history of architecture and art and graduate standing in the Master of Architecture program.

499

Architecture Elective II 2 TO 6 hours.

Special problems in theory, design, building science, or graphic skills (manual or automated). May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Completion of architecture graduate course work; or consent of the instructor.

510

Advanced Architectural Design I 8 hours.

Design of multiple or complex building types with emphasis on varying topics related to architectural design. **Prerequisite(s):** ARCH 554 and ARCH 564 and ARCH 574 or approval of the school. Restricted to students in the final year of study in the Master of Architecture program.

511

Advanced Architectural Design II 8 hours.

Design of a comprehensive, single case study with emphasis on varying topics related to architectural design. **Prerequisite(s):** ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591 or ARCH 596. Restricted to students in the final year of study in the Master of Architecture program.

512

Advanced Architectural Design I: Activist Practice 8 hours.

Design of multiple or complex building types, with an emphasis on the theoretical, technical, political, and economic considerations relating to community activism and identity politics.

Prerequisite(s): ARCH 554 and ARCH 564 and ARCH 574 or approval of the school. Restricted to students in the final year of study in the Master of Architecture program.

513

Advanced Architectural Design II: Activist Practice 8 hours.

Design of a comprehensive, single case study, with emphasis on theory and site planning, interior space, building systems, and materials relating to community activism and identity politics.

Prerequisite(s): ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591 or ARCH 596.

Restricted to students in the final year of study in the Master of Architecture program.

514

Advanced Architectural Design I: Architectural Technologies 8 hours.

Design of multiple, public buildings, with an emphasis on the relationship of aesthetics and construction methods in the making of comprehensive architecture. **Prerequisite(s):** ARCH 554 and ARCH 564 and ARCH 574 or approval of the school.

Restricted to students in the final year of study in the Master of Architecture program.

515

Advanced Architectural Design II: Architectural Technologies 8 hours.

Design of a single, public building, with an emphasis on the relationship of aesthetics and construction methods in the making of comprehensive architecture. **Prerequisite(s):** ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591 or ARCH 596. Restricted to students in the final year of study in the Master of Architecture program.

516

Advanced Architectural Design I: Digital Media 8 hours.

Design of multiple or complex building types, with an emphasis on the theoretical, technical, societal, and economic considerations relating to digital media. Extensive computer use required.

Prerequisite(s): ARCH 530 and ARCH 554 and ARCH 564 and ARCH 574; or approval of the school. Restricted to students in the final year of study in the Master of Architecture program.

517

Advanced Architectural Design II: Digital Media 8 hours.

Design of a comprehensive, single case study, with emphasis on theory and site planning, interior space, building systems, and materials relating to digital media. Extensive computer use required.

Prerequisite(s): ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591 or ARCH 596. Restricted to students in the final year of study in the Master of Architecture program.

518

Advanced Architectural Design I: Landscape Urbanism 8 hours.

Design of urban landscapes and public spaces as informed by large scale infrastructures, natural environments, and urban systems.

Prerequisite(s): ARCH 554 and ARCH 564 and ARCH 574 or approval of the school. Restricted to students in the final year of study in the Master of Architecture program.

519

Advanced Architectural Design II: Landscape Urbanism 8 hours.

Design of public building and/or space, including surrounding urban landscape with emphasis on perceptual, phenomenal, and temporal aspects of design. **Prerequisite(s):** ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591 or ARCH 596. Restricted to students in the final year of study in the Master of Architecture program.

520

Advanced Elective in Activist Practice 4 hours.

Study of contemporary theories and practices in community activism and identity politics. Restricted to students in the final year of study in the Master of Architecture program.

521

Advanced Elective in Architectural Technologies 4 hours.

Examination and analysis of influences on architecture relating to concept, program, function, location, cost, systems, regulation, materials, assemblage, and environmental influences on the resulting building aesthetic. Restricted to students in the final year of study in the Master of Architecture program.

522

Advanced Elective in Digital Media 4 hours.

Study of contemporary theories and practices in digital media and its relation to architecture. Restricted to students in the final year of study in the Master of Architecture program.

523

Advanced Elective in Landscape Urbanism 4 hours.

Examination of urban landscape projects from historical, theoretical, ecological, and infrastructural points of view. Restricted to students in the final year of study in the Master of Architecture program.

524

Advanced Elective: Special Topics 4 hours.

Advanced study in varying topics related to architecture. Restricted to students in the final year of study in the Master of Architecture program.

530

Computers in Architecture 4 hours.

The theory, tools, and techniques in applications of the computer as a



design tool, production, and presentation medium of two dimensional and three dimensional architectural design and building science. Previously listed as ARCH 430.

544 Contemporary Issues in Professional Practice 2 hours.

An introduction to the law and business of architecture, with an emphasis on alternative models for contemporary professional practice. **Prerequisite(s):** Approval of the department.

551 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. Previously listed as ARCH 451.

552 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. Previously listed as ARCH 452. **Prerequisite(s):** ARCH 551 and ARCH 561.

553 Architectural Design I 6 hours.

Design of housing in an urban context; analysis and theory of urban fabric and infrastructure; emphasis on architectural form and its relationship to societal factors and user needs. Previously listed as ARCH 453.

Prerequisite(s): ARCH 471 and ARCH 552 and ARCH 562; or approval of the department or graduate standing in the Master of Architecture two-year program.

554 Architectural Design II 6 hours.

Design of a public building as a comprehensive design; emphasis on site, context, zoning, codes, structural/mechanical systems, and materials in relation to aesthetics. Integration with ARCH 564 course material. Previously listed as ARCH 454. **Prerequisite(s):** ARCH 553 and ARCH 563 and ARCH 572 and ARCH 585 or graduate standing in the Master of Architecture two-year program.

561 Building Science I 4 hours.

Examines the architect's role in protecting the health, safety, and welfare of the public through responsible and ethical building practices. Previously listed as ARCH 461. **Prerequisite(s):** Approval of the school.

562 Building Science II 4 hours.

Introduction to building construction processes, terminology, principles, conventions, standards, applications, restrictions, and communications pertaining to construction materials and assemblies. Previously listed as ARCH 462. **Prerequisite(s):** ARCH 561.

563 Building Science III 4 hours.

Analysis and integration of architectural building systems. Building envelope, mechanical, electrical, plumbing, vertical transportation, life safety, and structural systems are examined. Previously listed as ARCH 463. **Prerequisite(s):** ARCH 562.

564 Building Science IV 4 hours.

Exploration into the concept of Total Building Performance. Exploration of conceptual and philosophical issues related to the application of advanced technology in the design, construction, and use of buildings. Previously listed as ARCH 464. **Prerequisite(s):** ARCH 563.

565 Topics Studio in Interior Intervention 8 hours.

Design of a complex project, with emphasis on small-scale intervention (e.g., rooms, equipment, and media) supported by the theoretical, technical, social, and economic considerations relating to the culture and production of architecture. Extensive computer use required. Fieldwork; field trips required at a nominal fee. **Prerequisite(s):** Approval of the department. **Corequisite(s):** Requires concurrent registration in ARCH 595.

566 Topics Studio in Building Intervention 8 hours.

Design of a complex project, with emphasis on medium-scale intervention (e.g., institutional or civic buildings) supported by the theoretical, technical, social, and economic considerations relating to the culture and production of architecture. Extensive computer use required. Fieldwork; field trips required at a nominal fee. **Prerequisite(s):** Approval of the department.

Corequisite(s): Requires concurrent registration in ARCH 595.

567 Topics Studio in Urban Intervention 8 hours.

Design of a complex project, with emphasis on large-scale intervention (e.g., housing or urban mixed-use developments) supported by the theoretical, technical, social, and economic considerations relating to the culture and production of architecture. Extensive computer use required. Fieldwork; field trips required at a nominal fee. **Prerequisite(s):** Approval of the department. **Corequisite(s):** Requires concurrent registration in ARCH 595.

568 Topics Studio in Regional Intervention 8 hours.

Design of a complex project, with emphasis on extra-large-scale intervention (e.g., transportation infrastructure) supported by the theoretical, technical, social, and economic considerations relating to the culture and production of architecture. Extensive computer use required. Fieldwork; field trips required at a nominal fee.

Prerequisite(s): Approval of the department. **Corequisite(s):** Requires concurrent registration in ARCH 595.

572 Architectural Structures III 4 hours.

Advanced analysis of structural elements, including fundamental structural planning criteria, stability and rigid body equilibrium, material properties/strength characteristics, historical and contemporary structural precedents. Previously listed as ARCH 472.

573 Architectural Structures IV 4 hours.

Introduction to the planning, analysis, and design of structural steel and timber assemblies. Previously listed as ARCH 473. **Prerequisite(s):** ARCH 470 and ARCH 471; or ARCH 572.

574 Architectural Structures V 4 hours.

Introduction to the planning, analysis, and design of reinforced concrete and masonry structures. Previously listed as ARCH 474. **Prerequisite(s):** ARCH 573.

585 Architecture Theory and Critical Analysis 4 hours.

Introduction to the intellectual tradition of modern architectural theory, with emphasis on methods and procedures of analysis, explored

through the critical interpretation and discussion of exemplary theoretical and historical texts. Previously listed as ARCH 485.

586 Readings in Contemporary Architectural Theory 4 hours.

Students engage advanced theoretical texts in architecture and adjacent disciplines, exploring alternative critical perspectives on a variety of topics, including time, form, space, technology, perception, and representation.

Prerequisite(s): Approval of the department.

591 Architectural Study Abroad 0 TO 17 hours.

Lectures, seminars, studio, and independent travel/study abroad. Architectural design, planning, structures, history, and technology. May be repeated to a maximum of 34 hours. Previously listed as ARCH 491. Fieldwork required.

Prerequisite(s): Completion of at least one year of architectural graduate course work; 3.00 cumulative grade point average in architecture; and approval of the school.

595 Thesis Seminar 2 hours.

Thesis seminar is an intensive, advanced program of readings, documentation, presentations, and discussion that structures and supports research activity related to individual thesis projects. Satisfactory/Unsatisfactory grading only. Fieldwork required.

Prerequisite(s): Approval of the department.

596 Independent Study for Graduate Students 1 TO 8 hours.

Individual study. May be repeated to a maximum of 16 hours.

Prerequisite(s): ARCH 510 or ARCH 512 or ARCH 514 or ARCH 516 or ARCH 518 or ARCH 551 or ARCH 554 or ARCH 591; and approval of the school. Restricted to students in the final year of study in the Master of Architecture program.

598 Thesis Research 0 TO 16 hours.

Individual research under faculty direction. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Approval of the school.



Art and Design (AD)

400

Foreign Studies

in Art and Design 1 TO 16 hours.

Study abroad within approved programs of foreign exchange and/or education. Satisfactory/Unsatisfactory grading only. May be repeated with approval. Approval to repeat course granted by the appropriate major area faculty committee, the director of the school, and/or director of graduate studies. Graduate credit only with approval of the director of the school and the director of graduate studies. **Prerequisite(s):** Junior or 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.

405

Smart Art: Physical Computing 0 TO 5 hours.

A practical and conceptual exploration into electronic sensors, processors, and effectors as applied to interactive media and interaction design. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 309 and credit or concurrent registration in AD 407; and senior standing or above; or consent of the instructor.

406

Advanced Special Topics in Art and Design 0 TO 5 hours.

Intensive workshops in specific art and design related topics and techniques directed and announced by the instructor. 1 to 4 undergraduate hours. 2 to 5 graduate hours. May be repeated. **Prerequisite(s):** Junior or graduate standing, and consent of the instructor.

407

Virtual Reality I 0 TO 5 hours.

A practical and conceptual exploration into the production of interactive virtual reality experiences for art and design. Virtual reality authoring tools and scripting. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 309 and credit or concurrent registration in AD 405; and senior standing or above; or consent of the instructor.

408

Virtual Reality II 0 TO 5 hours.

Advanced concepts and methods in interactive media and virtual reality production for art and design. Programming for customized software tool development. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 405 and AD 407 and credit or concurrent registration in AD 409; and credit or concurrent registration in AD 415; and senior standing or above; or consent of the instructor.

409

Electronic Visualization: Senior Project 0 TO 5 hours.

A practical and conceptual exploration into the production of a public interactive media event. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 405 and AD 407 and credit or concurrent registration in AD 408; and senior standing or above; or consent of the instructor.

410

Advanced Special Topics in Graphic Design 1 TO 5 hours.

Intensive workshops in specific graphic design related topics and techniques directed and announced by the instructor. 1 to 4 undergraduate hours. 2 to 5 graduate hours. May be repeated. A maximum of 8 hours of credit is allowed for undergraduates; 10 hours for graduate students. Extensive computer use required. **Prerequisite(s):** AD 315; and junior standing or above; and consent of the instructor. Portfolio review required.

411

Graphic Design Professional Practice 0 TO 5 hours.

Design projects with real-world clients in the private or public sector. The designer/client relationship. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** AD 315 and AD 317; and senior standing or above; and consent of the instructor.

412

Graphic Design Thesis 0 TO 5 hours.

Thesis topics chosen in consultation with graphic design faculty. 4 undergraduate hours. 5 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** Credit or concurrent registration in AD 315 and credit or concurrent registration in AD 317 and credit or concurrent registration in AD 411; and consent of the instructor.

413

Interactive Design 0 TO 5 hours.

Advanced examination of graphic design in the new media technologies. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 315 and credit or concurrent registration in AD 412, and senior standing or above.

414

Interactivity in Graphic Design 0 TO 5 hours.

Advanced examination of graphic design in the new media technologies. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 315 and AD 317 and credit or concurrent registration in AD 412.

415

Design Colloquium 4 OR 5 hours.

Presentations, lectures, and discussions conducted by faculty, design professionals, and individuals from design-related disciplines. Overview and contextual understanding of design theory, practice, process, and research. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** Senior standing or above, and consent of the instructor. Senior students must be in their final semester and preparing to graduate at the end of that semester.

418

Independent Study in Graphic Design 1 TO 5 hours.

Supervised independent study in graphic design. 1 to 4 undergraduate hours. 2 to 5 graduate hours. May be repeated. A maximum of 8 hours of credit is allowed for undergraduates; 10 hours for graduate students. Extensive computer use required. **Prerequisite(s):** Senior standing or above and consent of the instructor. Taken by faculty invitation only.

420

Interdisciplinary Product Development I 0 TO 5 hours.

"Real world" simulation collaborating in teams with other disciplines gathering, assimilating, and synthesizing information for problem identification to investigate and solve a problem. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 321 and AD 326 and credit or concurrent registration in AD 422; and senior standing or above; or consent of the instructor.

421

Interdisciplinary Product Development II 0 TO 5 hours.

"Real world" simulation collaborating in teams with other disciplines to assimilate and synthesize information into action plan, design development, and implementation within structured stage-gated product development process. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 420 and AD 422 and credit or concurrent registration in AD 423; and credit or concurrent registration in AD 415; and senior standing or above; or consent of the instructor.

422

Interactive Product Design II 0 TO 5 hours.

Advanced 2-D and 3-D methods in the design of interactive products and art works. Includes human factors, 3-D modeling, and design of 3-D virtual products. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 321 and AD 326 and credit or concurrent registration in AD 420; and senior standing or above; or consent of the instructor.

423

Industrial Design Thesis 0 TO 5 hours.

Capstone course that enables students to select and explore an area of industrial design research. 4 undergraduate hours. 5 graduate hours. Extensive computer use required. **Prerequisite(s):** AD 420 and AD 422 and credit or concurrent registration in AD 421; and credit or concurrent registration in AD 415; and senior standing or above; and consent of the instructor.

424

Industrial Design Independent Study 4 OR 5 hours.

Supervised independent study in any area of industrial design activity not covered in the regular curriculum. 4 undergraduate hours. 5 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** AD 320 and AD 321 and senior standing or above; and consent of the instructor.

425

Design Visualization 0 TO 5 hours.

Advanced principles, methodologies, and tools for designing both mechanical and electronic interactive products using digital tools as well as analysis utilizing prototyping and user-testing methods.



Applications include interactive Web site design. 4 undergraduate hours. 5 graduate hours. May be repeated up to 1 time. Extensive computer use required.

Prerequisite(s): AD 322 and senior standing or above; and consent of the instructor.

462

Advanced Art/ Studio Critique 6 hours.

Critique/discussion for advanced art majors. **Prerequisite(s):** AD 391 and senior standing or above; and consent of the instructor. Open only to Studio Arts, Photography, and Moving Image majors who have completed their major art requirements.

463

Art/Studio Thesis 6 hours.

Exhibition/thesis production and seminar culminating in an exhibition/final thesis show for graduating seniors. **Prerequisite(s):** AD 462 and senior standing or above; and consent of the instructor. Open only to Studio Arts, Photography, and Moving Image majors who have completed all requirements and are prepared to graduate.

471

Advanced Film/Video/ Animation 0 TO 5 hours.

Investigation of contemporary concerns in various areas of film and/or video activity under the direction of an instructor. 4 undergraduate hours. 5 graduate hours. May be repeated up to 2 times.

Prerequisite(s): AD 272 or AD 474, and consent of the instructor.

472

Independent Study in Film/Video/ Electronic Visualization 4 TO 12 hours.

Supervised independent study in any areas of cinema, video production, or electronic visualization. May be repeated to a maximum of 12 hours. Students may register for more than one four-hour section per term, or repeat the course in four-hour sections in subsequent terms. **Prerequisite(s):** 12 hours in any film, video, and/or electronic visualization courses and consent of the instructor.

482

Visual and Verbal Literacy in Art Education 4 hours.

Explores relevance of critical theory, text-based contemporary art, cultural studies, and aesthetics to the school art curriculum. Strategies for incorporating reading and writing into arts education.

May be repeated once if grade is lower than B. Fieldwork required.

Prerequisite(s): Grade of B or better in AD 281; and credit or concurrent registration in AD 382; and junior standing or above; and approval of the school.

484

Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Field experience plus lecture, demonstration, and discussion. May be repeated once if grade lower than B. Graduate credit only with approval of the school.

Prerequisite(s): Grade of B or better in AD 281 and grade of B or better in AD 382 and grade of B or better in AD 482; and credit or concurrent registration in AD 485; and senior standing or above and completion of 100-clock hours of pre-student-teaching field experiences and approval of the school.

485

Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Field experience, plus lecture, demonstration, and discussion. May be repeated once if grade lower than B. Graduate credit only with approval of the school.

Prerequisite(s): Grade of B or better in AD 281 and grade of B or better in AD 382 and grade of B or better in AD 482; and credit or concurrent registration in AD 484; and senior standing or above and good academic standing in a teacher education program and completion of 100-clock hours of pre-student-teaching field experience and approval of the school.

488

Computer Graphics I 0 TO 4 hours.

Principles of interactive computer graphics. Raster and vector display, techniques, and hardware considerations. Introduction to two-dimensional and three-dimensional rendering. Laboratory. **Same as** CS 488. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Credit or concurrent registration in CS 340.

494

Special Topics in Art Therapy 1 TO 5 hours.

Specializations, new developments in the field, in-depth study of theory, process, application, or independent study. 1 to 4 undergraduate hours. 2 to 5 graduate hours. May be repeated. Students may register in more than one section per term. A maximum of 8 hours of credit is allowed for undergraduates; 10 hours for graduate students.

Prerequisite(s): Consent of the instructor.

499

Cooperative Education 0 TO 4 hours.

Introduction to professional practice offering students the opportunity to couple academic learning with professional experience in an off-campus placement. Satisfactory/Unsatisfactory grading only. May be repeated. Only 8 hours of credit may be counted toward satisfying requirements for any art and design major. **Prerequisite(s):** Junior standing, a minimum cumulative grade point average of 3.00, and approval of the school.

500

Art and Design Teaching Internship 0 TO 2 hours.

Practical and theoretical aspects of teaching lecture/lab studio, and/or seminar courses in art and design. Satisfactory/Unsatisfactory grading only. May be repeated. No graduation credit.

Prerequisite(s): Consent of the instructor and consent of director of graduate studies.

502

Seminar in Contemporary Theory 4 hours.

Developments and current issues in contemporary design, studio, and media arts; major philosophies, debates, and social/environmental aspects (may include visiting lecturers, critics, and discussants). May be repeated. Must be repeated for a minimum of 16 hours of credit.

Prerequisite(s): Consent of the school, graduate faculty committee, and the student's adviser.

507

Special Projects in Art and Design 0 TO 16 hours.

Student initiated projects not covered in available curriculum. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 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.

Individualized graduate study; creative projects and research in electronic visualization through a consultative agreement with graduate faculty committee. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

509

Advanced Electronic Visualization 5 hours.

Individualized graduate study; creative projects and research in electronic visualization through a consultative agreement with graduate adviser. May be repeated.

Prerequisite(s): Consent of the school graduate faculty committee and the student's adviser.

510

Advanced Graphic Design and Critique 4 hours.

Individualized graduate study; creative projects and research in graphic design by each student through consultative agreement with graduate faculty committee. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

511

Advanced Graphic Design 5 hours.

Individualized graduate study; creative projects and research in graphic design by each student through consultative agreement with graduate adviser. May be repeated. **Prerequisite(s):** Consent of the school graduate faculty committee and the student's adviser.

520

Advanced Industrial Design and Critique 4 hours.

Individualized graduate study; creative projects and research in industrial design by each student through consultative agreement with graduate faculty committee. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

521

Advanced Industrial Design 5 hours.

Individualized graduate study; creative projects and research in industrial design by each student through consultative agreement with graduate adviser. May be repeated. **Prerequisite(s):** Consent of the school graduate faculty committee and the student's adviser.



530
Advanced Studio Arts and Critique 4 hours.
Individualized graduate study; creative projects and research in studio arts by each student through consultive agreement with graduate faculty committee. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

531
Advanced Studio Arts 5 hours.
Individualized graduate study; creative projects and research in studio arts by each student through consultive agreement with graduate adviser. May be repeated. **Prerequisite(s):** Consent of the School graduate faculty committee and the student's adviser.

560
Advanced Photography and Critique 4 hours.
A forum for presenting and discussing individual work with all photography graduates and faculty participating. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

561
Advanced Photography 5 hours.
Individualized graduate study; creative projects and research in photography by each student through consultive agreement with graduate adviser. May be repeated. **Prerequisite(s):** Consent of the school graduate faculty committee and the student's adviser(s).

570
Advanced Film/Animation/Video and Critique 4 hours.
Individualized graduate study; projects for creative research in film, video, and animation by each student through conference and consultive agreement with graduate faculty committee. May involve supportive consultation in other areas. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee.

571
Advanced Film/Animation/Video 5 hours.
Individualized graduate study; projects for creative research in film, video, and animation by each student through consultive agreement with graduate adviser. May involve supportive consultation in other areas. May be repeated. **Prerequisite(s):** Approval of the school graduate faculty committee and the student's adviser.

588
Computer Graphics II 4 hours.
State of the art in computer graphics and interactive techniques: Three-dimensional surface and volumetric models. A laboratory is required. **Same as** CS 526. **Prerequisite(s):** CS 488.

594
Special Topics in Art and Design 1 TO 4 hours.
Specialized research topics in art and design directed and announced by the instructor. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and the student's adviser.

597
Master's Project 0 TO 16 hours.
Independent research under faculty supervision in a specific area of interest. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 16 hours. **Prerequisite(s):** 20 hours of 500-level courses and consent of the instructor.

Art History (AH)

404
Topics in Architecture, Art, and Design 3 OR 4 hours.
Selected topics in the history of European and North American architecture, art, and design. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times if topics vary. Students may register in more than one section per term. **Prerequisite(s):** 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. **Prerequisite(s):** Graduate standing.

421
History of Architecture II 4 hours.
Introduction to architecture, urbanism, and architectural theory worldwide from 1450 to the present. **Prerequisite(s):** Graduate standing and AH 420.

422
Topics in the Literature of Architecture 3 OR 4 hours.
Discussion of selected readings in the theory and criticism of architecture. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3

hours in the history of architecture or consent of the instructor.

423
Topics in Modern and Contemporary Architecture 4 hours.
Selected topics in modern and contemporary architecture. May be repeated if topics vary. **Prerequisite(s):** Graduate standing, and four 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 3 OR 4 hours.
Developments in the history of photography since 1950. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours in the history of photography or consent of the instructor.

432
Topics in Film and Video 3 OR 4 hours.
Selected studies in genres, schools, individual artists, critics, and theorists of film and video. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** Graduate standing or 3 hours in the history of film or consent of the instructor.

434
Women and Film 3 OR 4 hours.
Roles and representations of women in classical Hollywood, European art, and independent feminist cinemas. **Same as** ENGL 472 and GWS 472. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ENGL 302 or ENGL 342 or ENGL 361 or ENGL 362 or ENGL 363; and senior standing or above; or consent of instructor.

435
Topics in Modern and Contemporary Design 3 OR 4 hours.
Topics in modern and contemporary design. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours in the history of design or consent of the instructor.

441
Topics in Medieval Art and Architecture 3 OR 4 hours.
Selected topics in European art and architecture of the Middle Ages. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours of medieval art and architecture or consent of the instructor.

450
Topics in Renaissance Art 3 OR 4 hours.
Selected topics in Early Renaissance, High Renaissance, or Mannerist Art and Architecture. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 3 hours in art history at the 200-level or above, or consent of the instructor.

460
Topics in Modern and Contemporary Art 3 OR 4 hours.
Selected topics in nineteenth- and twentieth-century modern and contemporary art. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours of modern art and architecture or consent of the instructor.

463
Topics in North American Art and Architecture 3 OR 4 hours.
Selected topics in North American art and architecture from colonial times to 1945. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 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 nineteenth century to the present, with an emphasis on contemporary Chicago art expressions.

465
Arts of the Black Atlantic 3 OR 4 hours.
Interdisciplinary and discursive explorations of the visual and artistic expressions of artists of African descent in the New World. 3 undergraduate hours. 4 graduate hours.

470
Topics in Non-Western Art and Architecture 3 OR 4 hours.
Selected topics in the art and architecture of Africa, Asia, Oceania, and the indigenous peoples of the Americas. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary.





471
Topics in Asian Art and Architecture 3 OR 4 hours.
Selected topics in the art and architecture of Asia. **Same as** ASST 471. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours of Asian art and/or architecture or consent of the instructor.

480
History of Collecting and Museology 3 OR 4 hours.
The history of collecting and patronage: public and private collections, museums, and commercial art galleries, government funding and the arts. Exhibition planning, research, selection, and catalog preparation. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** AH 110 and AH 111 or consent of the instructor.

481
Museum Practices 3 OR 4 hours.
Administration of visual arts organizations, their budgets, staffing, structures, accreditation, and long-range planning. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** AH 480 or consent of the instructor.

482
Museology Internship 6 OR 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(s):** AH 481 or consent of the instructor.

485
Introduction to Historic Preservation 3 OR 4 hours.
Preservation planning, historic building restoration, and the political and economic factors affecting the conservation of historic resources. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of art history at the 200-level or consent of the instructor.

490
Honors Thesis 3 hours.
Individual study on a project selected with the approval of the adviser. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Open only to seniors.

491
Study Abroad in Art History 0 TO 12 hours.
Study abroad within an approved foreign exchange program or department-sponsored program. May be repeated with approval. Approval to repeat course granted by the depart-

ment. **Prerequisite(s):** Approval of the department.

492
Readings in Art and Architecture History 3 OR 4 hours.
Individually planned readings on selected topics under the supervision of a faculty member. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. Students may register in more than one section per term. **Prerequisite(s):** Junior standing and 3 hours of Art History above the 100-level and consent of the instructor. Enrollment priority will be given to majors and graduate students in Art History.

510
Historiography of the Visual Arts, 1750 to 1960 4 hours.
Examines some of the intellectual underpinnings of art history, theory, and criticism and explores ways of doing research and making arguments in art history. **Prerequisite(s):** Graduate standing in Art History or consent of the instructor.

511
Toward New Histories of the Visual Arts, 1960 to the Present 4 hours.
Examines the transformation of Art History theory and criticism since 1960, with regard to issues of gender, class, ethnicity, popular culture, postcolonialism, and contemporary aesthetics. **Prerequisite(s):** Graduate standing in Art History or consent of the instructor.

512
Art History Teaching Seminar 0 hours.
Theoretical and practical aspects of teaching in undergraduate courses in the history of the visual arts. Satisfactory/Unsatisfactory grading only. May be repeated up to 1 time. **Prerequisite(s):** Graduate standing in the Art History program and appointment as a teaching assistant in the department.

522
Issues in Architecture, Design and Urbanism 4 hours.
Theories and contemporary critical issues relating to the history of the environment created and modified by people. Readings and presentations on historic and regional variations.

530
Seminar in the History of Photography 4 hours.
Selected topics in the history of photography, with emphasis on primary source materials for research purposes. May be repeated if topics vary.

550
Seminar in Renaissance and Baroque Art and Architecture 4 hours.
European art and architecture of the Renaissance. May be repeated if topics vary.

560
Seminar in Modern Architecture, Art, and Design 4 hours.
North American and European art, architecture, and design between 1780 and 1945. May be repeated if topics vary. Students may register in more than one section per term.

561
Seminar in Contemporary Architecture and Art 4 hours.
Selected topics in recent North American or European art, architecture, and design. **Prerequisite(s):** Consent of the instructor.

562
Issues in the Art of the Americas 4 hours.
Historical, theoretical, and critical issues in the art of the Americas and the Caribbean; indigenous, imported, and diasporan cultures and the interaction between them.

563
Seminar in North American Architecture and Art 4 hours.
North American art and architecture from the colonial period to 1945. May be repeated if topics vary. **Prerequisite(s):** 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.

590
MA Paper Research 0 hours.
Student will work with advisers on two qualifying papers. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

592
Preliminary Examination Research 0 TO 16 hours.
Supervised research and reading in preparation for the preliminary examinations. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Open only to PhD degree students. Only by consent of the director of graduate studies and after all other coursework has been completed.

596
Readings in Art and Architecture 1 TO 4 hours.
Individually planned readings on selected topics under the supervision of a faculty member. **Prerequisite(s):** Consent of the instructor.

598
Master's Thesis Research 0 TO 8 hours.
Individual research under faculty direction. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Consent of the instructor.

599
PhD Dissertation Research 0 TO 16 hours.
Supervised research on the part of the student. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 24 hours. **Prerequisite(s):** Consent of the instructor and satisfactory completion of the preliminary examination.

Asian Studies (ASST)

471
Topics in Asian Art and Architecture 3 OR 4 hours.
Selected topics in the art and architecture of Asia. **Same as** AH 471. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** 3 hours of Asian art and/or architecture or consent of the instructor.

472
Issues and Events in Twentieth-Century China 3 OR 4 hours.
Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history. **Same as** HIST 472. 3 undergraduate hours. 4 graduate hours. **Recommended background:** Previous course work in Chinese history at the 100- or 200-level.

473
Topics in East Asian History 3 OR 4 hours.
Specific topics are announced each term. **Same as** HIST 473. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of East Asian history or consent of the instructor.



478
Women in Chinese History 3 OR 4 hours.
Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution, and the historiography of the field. **Same as** GWS 478, and HIST 478. 3 undergraduate hours. 4 graduate hours.

Recommended background: Previous course work in Chinese history or women's studies.

479
Culture and Colonialism in South Asia 3 OR 4 hours.
Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947. **Same as** ANTH 479 and HIST 479. 3 undergraduate hours. 4 graduate hours.

Associated Health Sciences (AHS)

495
Urban Health Multicultural Seminar 1 hour.
Students attend multicultural and urban health-related seminars, participate in faculty-student discussion, academic presentations, and directed reading groups to integrate issues of cultural difference into students' professional development. Satisfactory/Unsatisfactory grading only. May be repeated. All Academy seminars are pre-approved; other approved events will be announced to students. Any off-campus events must have prior approval. One academic year is allotted for completion of seminar. Students should register the semester they begin attending lectures; grades will be deferred until course is completed. **Prerequisite(s):** Sophomore standing or above.

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(s):** Consent of the instructor.

594
Special Topics in Associated Health Sciences 1 TO 4 hours.
Selected topics of interest within disciplinary specialty areas of the allied health professions. Particular atten-

tion is given to topics of cross-cutting importance to these professions.

595
Seminar in Associated Health Sciences 1 hour.
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. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

596
Independent Study 1 TO 4 hours.
For graduate students who wish to pursue independent study not related to their project/thesis research. May be repeated. Students may register in more than one section per term.

597
Project Research in Associated Health Sciences 1 TO 4 hours.
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. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

Biochemistry and Molecular Genetics (BCMG)

411
Introduction to Biological Chemistry 4 hours.
Includes chemistry of cellular constituents; enzymology; metabolism of sugars, proteins, lipids, and nucleic acids; and regulation of metabolism. **Prerequisite(s):** Organic chemistry. Lecture course designed primarily for students in the College of Dentistry.

501
Faculty Research Seminars 1 hour.
Faculty presentation of research areas within molecular genetics. Satisfactory/Unsatisfactory grading only. Should be taken in the first year in the PhD in Biochemistry and Molecular Genetics program. **Prerequisite(s):** Graduate standing in the PhD in Biochemistry and 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(s):** GCLS 501 or consent of the instructor.

503
Research Methods in Biochemistry and Molecular Genetics 5 hours.
Laboratory course in experimental methods in biochemistry and molecular genetics. May be repeated to a maximum of 10 hours. **Prerequisite(s):** Consent of the instructor. Open only to students entering as PhD students in Biochemistry and Molecular Genetics.

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(s):** GCLS 501 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. **Same as** MIM 513 and PMPG 513. **Prerequisite(s):** GCLS 501 and one year of physical chemistry, 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(s):** GCLS 501 or consent of the instructor.

515
Journal Club 1 hour.
Student presentation and critical analysis of recent journal articles and current topics in biochemistry and molecular genetics. May be repeated. **Prerequisite(s):** Consent of the instructor.

522
Strategies for Effective Scientific Communication 1 hour.
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. Satisfactory/

Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

526
Molecular and Genetic Analysis of Development 3 hours.
Examines developmental mechanisms used in animal model systems. **Same as** BIOS 526. **Prerequisite(s):** Graduate standing or consent of the instructor.

531
Medical Biochemistry I 3 hours.
Chemistry of biopolymers; enzymology; metabolism of carbohydrates, lipids, amino acids and proteins; molecular biology. **Prerequisite(s):** Membership in the medical school class or consent of the instructor. Intended primarily for first-year medical students.

532
Introduction to Molecular Medicine and Genetics 3 hours.
Introduction to the principles of molecular medicine and genetics, including molecular biology, hemostasis, gene therapy, mechanisms of mutation, pharmacogenomics, cancer genetics, and immunogenetics. Intended primarily for medical students. **Prerequisite(s):** BCMG 531 and membership in the medical school and consent of the course coordinator.

533
Nutrition for Medical Students 2 hours.
Biochemical and nutritional basis of disease including heart disease, hypertension, obesity, malnutrition, and cancer. **Prerequisite(s):** BCMG 531 and BCMG 532 and membership in the medical school or consent of the instructor. Intended primarily for medical students.

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.

563
Principles of Molecular Medicine 3 hours.
A lecture/discussion/writing course which integrates biochemical and molecular biological concepts into a clinical context. Diseases will be described in terms of molecular mechanisms. **Prerequisite(s):** Consent of the instructor.



575
Topics in Biochemistry and Molecular Genetics 3 hours.

Students will be exposed to, present, and discuss recent scientific literature in biochemistry and molecular genetics.

Prerequisite(s): Completion of the first year of the program and consent of the instructor.

594
Special Topics in Biochemistry and Molecular Genetics 1 TO 3 hours.

Topics of current interest in the field of biochemistry and molecular genetics. May include protein structure, membrane proteins and trafficking, development and gene regulation, signal transduction, and cancer biology. May be repeated to a maximum of 6 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

595
Student Research Seminars 1 hour.

Research presentations by graduate students in the Biochemistry and Molecular Genetics program. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Consent of the instructor.

598
Master's Thesis Research 0 TO 16 hours.

Investigation carried out by MS candidate under the direction of a faculty member leading to the MS in Biochemistry and Molecular Genetics. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

599
PhD Thesis Research 0 TO 16 hours.

Independent dissertation research by the student, under the guidance of the adviser. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Advanced standing in the PhD in Biochemistry and Molecular Genetics program.

Bioengineering (BIOE)

402
Medical Technology Assessment 2 OR 3 hours.

Bioentrepreneur course. Assessment of medical technology in the context of commercialization. Objectives, competition, market share, funding,

pricing, manufacturing, growth, and intellectual property; many issues unique to biomedical products. 2 undergraduate hours. 3 graduate hours. **Prerequisite(s):** Junior standing or above and consent of the instructor.

406
Regulation and Manufacturing Practices in Medical Technology 2 OR 3 hours.

Bioentrepreneur course. Product requirement definition, FDA, quality system regulation, community Europe, medical device directive, role of management, United States pharmacopoeia, toxicity testing, hazard analysis, risk assessment, import/export. 2 undergraduate hours. 3 graduate hours.

Prerequisite(s): Junior standing or above and consent of the instructor.

407
Pattern Recognition I 3 OR 4 hours.

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. **Same as** ECE 407. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): MATH 220.

408
Medical Product Development 2 OR 3 hours.

Bioentrepreneur course. Major stages of medical product development (investigative, feasibility, development, commercialization, maturation, and growth), regulatory issues, product performance, failure mode and effect analysis, hazard analysis. 2 undergraduate hours. 3 graduate hours.

Prerequisite(s): Junior standing or above and consent of the instructor.

415
Biomechanics 3 OR 4 hours.

Use of rigid and deformable body statics and rigid body dynamics to analyze various aspects of the human musculoskeletal system. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 204 and ME 210; and either BIOS 442 or BIOS 443.

420
Introduction to Field and Waves in Biological Tissues 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 310.

421
Biomedical Imaging 3 OR 4 hours.

Introduction to engineering and scientific principles associated with X-ray, magnetic resonance, ultrasound, computed tomographic, and nuclear imaging. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** MATH 210 and PHYS 142.

430
Bioinstrumentation and Measurements I 3 OR 4 hours.

Theory and application of instrumentation used for physiological and medical measurements. Characteristics of physiological variables, signal conditioning devices, and transducers. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 210; and BIOS 100 or higher.

431
Bioinstrumentation and Measurement Laboratory 2 hours.

Practical experience in the use of biomedical instrumentation for physiological measurements. **Prerequisite(s):** Credit or concurrent registration in BIOE 430.

432
Bioinstrumentation and Measurements II 3 OR 4 hours.

Principles of bioinstrumentation for the assessment of physiological function and therapeutic intervention. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** BIOE 430.

433
Bioinstrumentation and Measurements II Laboratory 1 hour.

Laboratory experiments using instruments to assess physiological function. **Prerequisite(s):** Credit or concurrent registration in BIOE 432.

439
Biostatistics II 4 hours.

Statistical treatment of data, model estimation, and inference are treated in a framework of biological experiments and attributes of data generated from such experiments. Credit is not given for BIOE 439 if the student has credit for BSTT 400. Extensive computer use required.

Prerequisite(s): MATH 210 and CS 108 and consent of the instructor. **Recommended background:** Knowledge of MatLab.

440
Biological Signal Analysis 3 OR 4 hours.

Analysis of signals of biological origin. Transient signals. Stability analysis. Control. Probabilities, stochastic processes. Medical applications. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** MATH 210 and senior or graduate standing.

450
Molecular Biophysics of the Cell 4 hours.

Introduction to molecular length, time, force, energy scales; statistical thermodynamics of solutions; DNA, RNA, and protein structure and function; experimental methods. **Same as** PHYS 450. **Prerequisite(s):** PHYS 245 or the equivalent.

452
Biocontrol 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 310; and either BIOS 442 or BIOS 443.

455
Introduction to Cell and Tissue Engineering 3 OR 4 hours.

Foundation of cell and tissue engineering covering cell technology, construct technology, and cell-substrate interactions. Emphasis on emerging trends and technologies in tissue engineering. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): BIOS 100 and CME 260 or the equivalent.

456
Cell and Tissue Engineering Laboratory 2 hours.

Includes polymer scaffold fabrication, microstamping biomolecules, cellular adhesion and proliferation assays, and immo/fluorescent tagging. **Prerequisite(s):** BIOE 455 or consent of the instructor.

460
Materials in Bioengineering 3 OR 4 hours.

Analysis and design considerations of problems associated with prostheses and other implanted biomedical devices. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): CME 260 and either BIOS 442 or BIOS 443.

470
Bio-Optics 3 OR 4 hours.

Physical principles and instrumentation relevant to the use of light in

biomedical research. Several current and developing clinical applications are explored. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHYS 142.

472

Models of the Nervous System 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 310; and either BIOS 442 or BIOS 443.

475

Neural Engineering I: Introduction to Hybrid Neural Systems 3 OR 4 hours.

Modeling, design, and analysis of hybrid systems comprised of living neurons and artificial components; examples drawn from neural and neuromuscular prostheses, biosensors, and biopotential control of robotics. **Same as** BIOS 475. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** BIOS 442 and credit or concurrent registration in BIOE 472.

476

Neural Engineering I Laboratory 2 hours.

Hands-on experience with computational and experimental models of engineered neural systems, with emphasis on neuroprostheses and biosensors. Animals used in instruction. **Prerequisite(s):** Credit or concurrent registration in BIOE 475.

480

Introduction to Bioinformatics 3 OR 4 hours.

Computational analysis of genomic sequences and other high throughput data. Sequence alignment, dynamic programming, database search, protein motifs, cDNA expression array, and structural bioinformatics. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** BIOS 100 and CS 201; or consent of the instructor.

481

Bioinformatics Laboratory 2 hours.

How to use bioinformatics tools, including sequence alignment methods such as Blast, Fasta, and Pfam, as well as structural bioinformatics tools, such as Rasmol and CastP. Extensive computer use required.

Prerequisite(s): Credit or concurrent registration in BIOE 480; and senior standing or above; and consent of the instructor.

482

Introduction to Optimization Methods in Bioinformatics 3 OR 4 hours.

The objectives are to provide the students with a basis for understanding principles of the optimization methods and an insight on how these methods are used in bioinformatics. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** BIOS 100 and CS 201.

483

Molecular Modeling in Bioinformatics 3 OR 4 hours.

Basic structural and dynamics tools in protein structure prediction, structure comparison, function prediction, Monte Carlo, and molecular dynamics simulations. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of B or better in BIOE 480.

494

Special Topics in Bioengineering 1 TO 4 hours.

Special topics to be arranged. 3 may be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

500

Interfacial Biosystems Engineering 4 hours.

Advanced and detailed exposition of the fundamentals of biological systems using quantitative approaches. Areas of concentration include bioinformatics, cell and tissue engineering, and neuroengineering. **Prerequisite(s):** BIOS 442.

504

Emerging Medical Technologies 2 hours.

Investigates new and emerging medical technologies following the technical due diligence process, a methodical evaluation of strengths, weaknesses, opportunities, and threats of the identified technology. **Prerequisite(s):** BIOE 401 or BIOE 402 or BIOE 403 or the equivalent.

514

Biotransport 4 hours.

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. **Same as** CHE 514. **Prerequisite(s):** 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 modeling of intact ligamentous spine. Nature and treatment of adolescent idiopathic scoliosis. Thoracolumbar injuries.

Prerequisite(s): BIOE 415 or the equivalent.

518

Controlled Drug Delivery 3 hours.

Controlled drug delivery systems utilizing polymers, synthesis of different types of devices, and the delivery expected from these devices, and mathematical modeling of delivery systems. **Same as** BPS 518. **Prerequisite(s):** MATH 220 or approval of the department.

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(s):** BIOE 420.

522

Principles of Polymeric Science and Engineering 3 hours.

Intermediate polymer science, thermodynamics of polymer solutions, phase separations, MW determination, crystallization, elasticity, kinetics, and processing.

Same as BPS 522.

Prerequisite(s): MATH 220 or consent of the instructor.

525

Physiological and Cellular Effects of Biomechanical Forces 4 hours.

Discuss how biomechanical forces are generated, the impact the forces have on cells and tissues, plus methods for studying them. Mechanisms by which cells may sense forces and transduce this information to the nucleus are also covered. **Prerequisite(s):** Consent of the instructor.

548

Micro and Nanotechnology for Biomedical Applications 4 hours.

This course covers selected topics in micro and nanotechnology underlying biomedical applications; topics include: microfabrication and nanofabrication; microfluidic processes; neuroMEMS; nanoscale structures as functional biointerfaces. **Prerequisite(s):** PHYS 244.

550

Principles of Cell and Tissue Engineering 4 hours.

Introduction to tissue engineering. Presents principles of biomedical, biochemical, and biomaterials sci-

ence applied to tissue-engineered organ replacements, implantable medical devices, and drug delivery systems. **Prerequisite(s):** BIOS 442 or BIOS 443; and CME 260. **Recommended background:** A course in cell biology.

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(s):** BIOE 452.

560

Processing and Properties of Structural Biomaterials 4 hours.

Considers the interrelationships between atomic bonding, atomic/molecular structure, and material processing to provide a fundamental understanding of the properties and performance of advanced biomaterials. **Prerequisite(s):** CME 260. **Recommended background:** Credit in BIOE 460.

575

Neural Engineering II—Neural Coding 4 hours.

Analytical techniques and models used to assess and predict neural activity. Emphasis on information coding in sensory systems.

Prerequisite(s): Consent of the instructor. **Recommended background:** Working knowledge of MATLAB

576

Sensory Prostheses Engineering 4 hours.

Critical review of existing and emerging prosthetic devices for sensory systems damaged by trauma or disease. Technology and information flow in hybrid systems are emphasized. **Prerequisite(s):** BIOE 475 and BIOS 442; or consent of the instructor.

579

Neural and Neuromuscular Prostheses 4 hours.

Neuromuscular electrical stimulation for ambulation by paraplegics, of upper limb in tetraplegics, of vocal cord and breathing functions, stimulation of bladder, cochlea, retina, and visual cortex. **Prerequisite(s):** Consent of the instructor.

580

Principles of Bioinformatics 4 hours.

Bioinformatics analysis of sequence, phylogeny and molecular structure. Focus on probabilistic models and algorithms, as well as structural





analysis. Extensive computer use required. **Prerequisite(s):** BIOE 480; and graduate or professional standing; or consent of the instructor. **Recommended background:** Exposure to biochemistry, molecular biology, or evolution.

582

Computational Functional Genomics 4 hours.

Modern statistical and computational methods relevant to functional genomics. Cell function, gene regulation, and protein expression. Microarray technology and use; cluster analysis; prediction of protein function. **Prerequisite(s):** BIOE 480. **Recommended background:** Basic knowledge of probability, statistics, vector algebra, calculus, and cell biology.

590

Internship in Bioengineering 1 TO 4 hours. Current clinical practice experience in a healthcare setting culminating in a written and oral report. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** BIOE 430 and BIOE 431 and BIOE 479.

594

Advanced Special Topics in Bioengineering 1 TO 4 hours. Systematic review of selected topics in bioengineering theory and practice. Subjects vary from year to year. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595

Seminar on Bioengineering 0 TO 1 hour. Recent innovations in bioengineering theory and practice presented by invited speakers, faculty, and graduate students. Satisfactory/Unsatisfactory grading only. May be repeated. Students who are presenting seminars should register for 1 hour, others for 0 hours.

596

Independent Study 1 TO 5 hours. Research on special problems not included in thesis research. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

598

Masters Thesis Research 0 TO 16 hours. Research in MS thesis project. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

599

PhD Thesis Research 0 TO 16 hours. Research in PhD thesis project. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Biological Sciences (BIOS)

402

Educational Practice with Seminar I 6 hours. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

403

Educational Practice with Seminar II 6 hours. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in BIOS 402, and approval of the department.

416

Natural Products 3 OR 4 hours. Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. **Same as** CHEM 456. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One year of organic chemistry.

424

Mammalian Histology 4 hours. The microscopic anatomy of tissues and organs in relation to their function. **Prerequisite(s):** BIOS 225 or BIOS 272.

429

Laboratory in Electron Microscopy 3 hours. Laboratory instruction in cell preparation and instrument operation in transmission and scanning electron microscopy. Satisfactory/Unsatisfactory grading only.

Animals used in instruction.

Prerequisite(s): 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(s):** BIOS 220.

431

Plant and Animal Interactions 3 hours. Ecology of nonsymbiotic relationships of plants and animals, including protection mutualisms, pollination, seed dispersal, animal herbivory, and plant defense. **Prerequisite(s):** BIOS 100 and BIOS 101 or the equivalent; and any 200- or 300-level course in biological sciences.

432

Restoration Ecology 3 hours. Philosophical, historical, and ecological basis for ecological restoration with emphasis on readings in the primary literature and writing. **Prerequisite(s):** BIOS 330 or the equivalent.

433

Plant Diversity and Conservation 4 hours. Focus on seed-plant diversity: morphological features and family identification; major evolutionary process; evolutionary relationships among plant groups; and goals, problems, and progress in the conservation of plant diversity. **Prerequisite(s):** BIOS 230.

434

Population Biology 3 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(s):** BIOS 220 and MATH 180.

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(s):** Two years of biological sciences.

443

Animal Physiological Systems 4 hours. Basic function of renal, respiratory, and digestive systems. Integrative role of endocrine systems. Animals used in instruction. **Prerequisite(s):** Two years of biological sciences.

Recommended background:

Credit in BIOS 442.

448

Environmental Toxicology 3 hours. Sources of environmental pollution and their ecological and health effects. **Prerequisite(s):** BIOS 100 and BIOS 101; 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. **Prerequisite(s):** BIOS 350. **Recommended background:** Credit in BIOS 456 is strongly recommended.

452

Biochemistry I 4 hours. Chemistry of proteins, nucleic acids, carbohydrates, and lipids. **Same as** CHEM 452. **Prerequisite(s):** Credit or concurrent registration in CHEM 234.

454

Biochemistry II 4 hours. Continues BIOS 452. Carbohydrate and lipid metabolism, electron transport. Metabolism of amino acids, nucleic acids, proteins. Biosynthesis of macromolecules and regulation of macromolecular synthesis. **Same as** CHEM 454. **Prerequisite(s):** BIOS 452 or CHEM 452.

457

General Virology 4 hours. Nature of viruses, their morphology, chemical composition, assay, host-parasite interactions, and life cycles. **Prerequisite(s):** BIOS 220; and either BIOS 222 or BIOS 350.

466

Principles of Paleontology 4 hours. Theory and methods of evolutionary paleobiology; includes paleoecology, functional morphology, and major features of organic evolution. **Same as** EAES 466. **Prerequisite(s):** EAES 360 or BIOS 360 or consent of the instructor.

475

Neural Engineering I: Introduction to Hybrid Neural Systems 3 OR 4 hours. Modeling, design, and analysis of hybrid systems comprised of living neurons and artificial components; examples drawn from neural and neuromuscular prostheses, biosensors, and biopotential control of

robotics. **Same as** BIOE 475. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** BIOS 442 and credit or concurrent registration in BIOE 472.

483

Mammalian Neuroanatomy 5 hours. Structure and function of the mammalian central nervous system. Animals used in instruction. **Prerequisite(s):** BIOS 225 or BIOS 272.

484

Neuroscience I 3 hours. Neuroscience as an integrative discipline. Neuroanatomy of vertebrates, neural development, cellular neurobiology, action potential mechanisms, synaptic transmission, and neuropharmacology. **Same as** PHIL 484 and PSCH 484. **Prerequisite(s):** BIOS 286 or PSCH 262.

485

Neuroscience II 3 hours. Integrative neuroscience, continuation of BIOS/PSCH/PHIL 484. Sensory and motor systems; learning, memory, and language. Pathology of nervous systems. Philosophical perspectives and modeling. **Same as** PHIL 485 and PSCH 485. **Prerequisite(s):** BIOS 484.

486

Animal Behavior and Neuroethology 4 hours. 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. Animals used in instruction. **Prerequisite(s):** One advanced course in zoology and animal physiology.

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. **Prerequisite(s):** BIOS 220 and either BIOS 225 or BIOS 420.

489

Cellular Neurobiology Laboratory 3 hours. Recording from and analyzing the activity of nerve cells, neuronal networks, and other electrically excitable tissues. **Prerequisite(s):** BIOS 286 or the equivalent.

490

Topics in Ecology and Evolution 3 TO 4 hours. In-depth analysis of advanced topics in ecology and evolution, involving reading primary literature, term paper, student presentations, and critical discussion. Credit varies according to topic offered. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Graduate standing or consent of the instructor.

520

Topics in Genetics 2 hours. Discussion of selected topics of current interest in genetics. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** BIOS 220 and BIOS 221 and consent of the instructor.

524

Molecular Biology I 5 hours. Structural properties and analysis of DNA, RNA, and proteins; principles of cloning and recombinant DNA technologies; DNA replication, repair, recombination, and transposition. **Prerequisite(s):** Consent of instructor.

525

Molecular Biology II 5 hours. Gene organization and function in lambda, prokaryotes and eukaryotes; promoters, enhancers, RNA splicing, developmental regulation; protein secretion and targeting. **Prerequisite(s):** BIOS 524 or consent of the instructor.

526

Molecular and Genetic Analysis of Development 3 hours. Examines developmental mechanisms used in animal model systems. **Same as** BCMG 526. **Prerequisite(s):** Graduate standing or consent of the instructor.

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. **Same as** ANAT 527. **Prerequisite(s):** Credit in one neuroscience course or consent of the instructor.

530

Population Ecology 3 hours. Life histories, population processes and interactions, and theories of distribution and abundance. **Prerequisite(s):** BIOS 220 and BIOS 221 and BIOS 330 and BIOS 331 and consent of the instructor.

531

Introduction to Ecology and Evolution I 3 hours. Concepts, techniques, and skills needed for research in ecology and evolution. **Prerequisite(s):** Consent of the instructor.

532

Introduction to Ecology and Evolution II 3 hours. Evolutionary and physiological research. **Prerequisite(s):** Consent of the instructor.

535

Ecosystems 3 hours. Flow of energy and nutrients in aquatic and terrestrial environments. **Prerequisite(s):** BIOS 330.

539

Seminar in Ecology and Evolution 0 TO 1 hour. Graduate student and faculty seminars on selected topics in ecology and evolution. Credit is given only upon completion of a seminar presentation. Satisfactory/Unsatisfactory grading only. May be repeated.

552

Chemical Biology 4 hours. Major trends and recent developments in research at the interface of chemistry and biology. **Same as** CHEM 552.

559

Special Topics in Biochemistry 3 TO 4 hours. Selected topics of current interest in biochemistry. **Same as** CHEM 559. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** CHEM 454 or BIOS 454 or consent of the instructor.

560

Topics in Paleontology 3 TO 4 hours. In-depth analysis of current problems and issues in paleontology, involving reading primary literature, student presentations, and critical discussions. **Same as** EAES 560. May be repeated if topics vary. **Prerequisite(s):** Consent of the instructor.

582

Methods in Modern Neuroscience 2 hours. Underlying principles and applications of techniques used to analyze nervous system organization and function. Behavioral, electrophysiological, anatomical, and biochemical approaches are considered. **Same as** NEUS 582. Animals used in instruction.

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. **Same as** ANAT 586. **Prerequisite(s):** BIOS 442 or consent of the instructor.

587

Topics in Neurobiology 1 TO 2 hours. In-depth analysis of advanced topics in neurobiology, involving reading primary literature, student presentations, and critical discussion. Credit varies according to the topic offered. May be repeated. Students may register in more than one section per term.

592

Research Seminar 1 TO 2 hours. Presentation of student research with an emphasis on problem-solving and theoretical implications. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of instructor.

593

Introduction to Laboratory Research 2 TO 6 hours. A hands-on, in-depth introduction to selected research topics and laboratory techniques designed for the beginning graduate student. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

594

Special Topics in Biological Sciences 1 TO 2 hours. Selected aspects in biological sciences. Credit varies according to the seminar offered. May be repeated. Students may register in more than one section per term.

595

Departmental Seminar 0 hours. Weekly seminar by staff and invited speakers. Required of graduate students every semester. Satisfactory/Unsatisfactory grading only. May be repeated.

596

Independent Study 1 TO 4 hours. Individualized research projects of limited scope. Not to be used for MS/PhD thesis research. Satisfactory/Unsatisfactory grading only. May be repeated. Students





may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

**597
Project
Research 2 TO 8 hours.**

Guided research projects on selected topics in specific fields of advanced modern biology. Not to be used for thesis research. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

**598
Master's Thesis
Research 0 TO 16 hours.**

Independent research in specialized projects under the direction of a faculty member with appropriate graduate standing, leading to completion of master's thesis. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

**599
Doctoral Thesis
Research 0 TO 16 hours.**

Independent research on specialized topics under the direction of a faculty member with appropriate graduate standing, leading to completion of PhD thesis. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Biomedical and Health Information Sciences (BHIS)

**405
Medical Sciences and Human Pathophysiology 0 TO 4 hours.**

Introduction of fundamental concepts in pathophysiology. Specific disorders of major organ systems including etiology, manifestations, diagnostic tests, treatment modalities, pharmacotherapy, and complications. Credit is not given for BHIS 405 if the student has credit for AHS 420 or HIM 313 or HIM 314. Students who require a medical terminology component register for 4 hours and participate in both laboratory and lecture-discussion; all others register for 3 hours and attend lecture-discussion only. Restricted to students who require this course for graduation. Students outside these restrictions may be admitted with consent of the instructor.

**410
Health Data Structures and Management 3 hours.**

Data structures in clinical information systems, including database design and management, networking and security. Emphasis on "intrapreneurial" skills required to solve organizational information management problems. **Prerequisite(s):** BHIS 400 and BHIS 480.

**433
Principles of Evidence-Based Healthcare 2 hours.**

Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, and comparing scientific papers as bases for healthcare education and practice. **Same as** MHPE 433. **Prerequisite(s):** Graduate or professional standing and approval of the school.

**437
Healthcare Data 3 hours.**

Review of data types in a healthcare information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems. **Same as** HPA 437. Taught online only. A UIC netid is required. **Prerequisite(s):** Graduate standing and consent of the instructor.

**460
Introduction to Health Informatics 1 hour.**

Introduction to information technology and systems in a healthcare setting; collection, analysis, and management of healthcare data; storage, retrieval, and networking; system security. Credit is not given for BHIS 460 if the student has credit for NUSC 218 or IPHS 420. Taught online with some essential classroom lectures. Students must have an active UIC netid with valid password and access to a computer and the Internet. **Prerequisite(s):** Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. **Recommended background:** IDS 100 or the equivalent.

**461
Information Systems for Health Information Management 2 hours.**

Advanced topics in information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; special issues related to the role of health infor-

mation administrators. Credit is not given for BHIS 461 if the student has credit for BHIS 400. Extensive computer use required. **Prerequisite(s):** IDS 100 and credit or concurrent registration in BHIS 460.

**480
Management and Business Practices 3 hours.**

Principles of management with emphasis on business functions, procedures, and organizational structure as applied to various healthcare settings including private and institutional practice. **Prerequisite(s):** Advanced undergraduate or graduate standing in the Department of Biomedical and Health Information Sciences or consent of the instructor.

**499
Information Sources in Biomedical and Health Information Sciences 1 hour.**

Prepares students to locate, interpret, and evaluate pertinent research information sources. Includes discussion on writing literature reviews. Assignments require the use of a computer with Internet access. **Prerequisite(s):** Junior standing or above required; or consent of the instructor.

**500
Strategic Inquiry in BHIS 3 hours.**

An overview of research methods appropriate for BHIS, in order to better enable students to make research method decisions appropriate for their self-selected research project topics. **Prerequisite(s):** Consent of the instructor.

**503
Communication Skills in Health Informatics 2 hours.**

An application course in which students assess and practice effective written and oral methods of communication skills necessary for health informatics professionals. **Prerequisite(s):** Consent of the instructor.

**504
Methods in Qualitative Inquiry 3 hours.**

Qualitative research methods to account for systematic description of environments where quantitative methods are not sufficient. **Prerequisite(s):** BHIS 500 and BHIS 510 or consent of the instructor.

**505
Ethics and Legal Issues in Health Informatics 3 hours.**

Examination of the legal and ethical issues involved in computerized health information systems. Taught online only. A UIC netid is required. **Prerequisite(s):** Consent of the instructor.

**510
Healthcare Information Systems 4 hours.**

Examination, through case studies, group and class discussions, and problem-based learning, of the effective utilization of information technology applications currently in place and on the horizon in healthcare organizations. **Same as** HPA 510. Taught online only. A UIC netid is required.

Prerequisite(s): Graduate standing and consent of the instructor.

**511
Application of Healthcare Information Systems 2 hours.**

Experience with a variety of healthcare applications utilizing current information technology and systems implemented in healthcare provider organizations. Students are expected and required to attend computer training laboratory sessions in the UICMC, times to be arranged with training department personnel. Students will be working in UICMC and are required to comply with security, patient confidentiality, and HIPAA regulations.

Prerequisite(s): BHIS 510 or consent of the instructor.

Registration restriction(s): Certification of completion of netlearning HIPAA training module is required for admission to this course.

**515
Management of Healthcare Communication Systems 4 hours.**

Examination and management of data communications in and between healthcare facilities, including examination of issues, standards, technologies, and system configurations. **Same as** HPA 520. Taught online only. A UIC netid is required.

Prerequisite(s): BHIS 510 or HPA 510; and graduate standing and consent of the instructor.

**517
Healthcare Information Security 3 hours.**

Health information security and methods to achieve it; stresses risk assessment and preemptive action; outlines important role of security policies and procedures; surveys



security technology with focus on nontechnical security approaches. Taught only online. A UIC netid is required. **Prerequisite(s):** BHIS 437 and BHIS 510 or consent of the instructor.

520 Health Information Systems Analysis and Design 4 hours.

A project course applying systems analysis and design theory to healthcare systems evaluation, modeling, and implementation. **Same as** HPA 531. Taught online only. A UIC netid is required.

Prerequisite(s): BHIS 510 or HPA 510; and graduate standing and consent of the instructor.

525 Social and Organizational Issues in Health Informatics 4 hours.

Examines the impact of information systems on the healthcare organization and applies theory through case study analysis. **Same as** HPA 540. Taught only online. A UIC netid is required. **Prerequisite(s):** BHIS 510 or HPA 510; and BHIS 515 or BHIS 520 or BHIS 530 or HPA 520 or HPA 531 or HPA 550; or consent of the instructor.

527 Knowledge Management in Healthcare Organizations 3 hours.

An examination, through readings, case studies, research publications, and discussion, of the current issues, concepts, and technologies of knowledge management in healthcare organizations. Extensive computer use required. May be offered online, using synchronous and asynchronous discussion, in conjunction with seminar format.

Prerequisite(s): Grade of B or better in BHIS 510; and consent of the instructor.

528 Consumer Health Informatics 3 hours.

Examines the developing area of consumer health informatics from both theoretical and practical knowledge management perspectives through class discussions.

Prerequisite(s): BHIS 510 and BHIS 527 or consent of the instructor. **Recommended background:** BHIS 505.

530 Topics in Health Informatics 4 hours.

Current theories and methods in health informatics. **Same as** HPA 550. Taught online only. A UIC netid is required. **Prerequisite(s):** BHIS 510 or HPA 510; and

BHIS 515 or HPA 520, or BHIS 520 or HPA 531, or BHIS 525 or HPA 540; and graduate standing and consent of the instructor.

535 Group Dynamics for HI Professionals 2 hours.

Team and negotiation skills as well as developing project management competencies unique to the health informatics profession.

Prerequisite(s): Consent of the instructor.

537 Healthcare IT Vendor Management 3 hours.

Examines the environment and activities necessary to plan, select, contract, and implement systems from suppliers in the healthcare IT industry. **Prerequisite(s):** BHIS 510 or consent of the instructor.

538 Healthcare IT Administration 3 hours.

Examines organizational and management issues in healthcare IT **Prerequisite(s):** BHIS 510 and BHIS 511 and BHIS 537 or consent of the instructor.

546 Leadership Development in Health Informatics 3 hours.

Students will analyze, evaluate, and practice the competencies necessary for leadership unique to the health informatics profession. **Prerequisite(s):** Consent of the instructor.

580 Practicum in Biomedical and Health Information Sciences 3 TO 12 hours.

Field experience under supervision of a professional expert in a biomedical and health information sciences setting that is consistent with the student's area of study and career goals. May be repeated. **Prerequisite(s):** Consent of the instructor.

594 Special Topics in Biomedical and Health Information Sciences 1 TO 3 hours.

An in-depth study of a health informatics topic of importance selected by the faculty. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595 Seminar in Biomedical and Health Information Sciences 1 hour.

Provides students with an opportunity to present preliminary

research for critique by peers and faculty. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): BHIS 499 and BHIS 500 or consent of the instructor.

596 Independent Study 1 TO 4 hours.

For graduate students who wish to pursue independent study not related to their project/thesis research. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

597 Project Research in Biomedical and Health Information Sciences 0 TO 5 hours.

Independent investigation that draws upon the professional experience and knowledge synthesis of the student. Students investigate a topic/problem in their field, write an article, and deliver an oral presentation. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** BHIS 499, 500, and 595; and consent of the instructor.

598 Research in Biomedical and Health Information Sciences 0 TO 16 hours.

Independent research in one area of biomedical and health information sciences directed by a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Foundation courses in research and statistics, or consent of the instructor.

Biomedical Visualization (BVIS)

400 Clinical Sciences for Biomedical Visualization 2 hours.

The application of neuroanatomy, genetics, immunology, imaging, and pharmacology to biomedical visualization. An introduction to visual information processing, visual perception, and related technology. **Prerequisite(s):** Graduate standing.

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(s): Graduate standing and 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(s):** Graduate standing and 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(s):** Graduate standing; and 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. **Prerequisite(s):** Graduate standing; and 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(s): Graduate standing and 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(s):** Graduate standing and 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, healthcare exhibits. Exploration of materials and techniques for impression taking, sculpting, mold construction, and casting. **Prerequisite(s):** Graduate standing.

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(s): Graduate standing and 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(s): BVIS 450.

520

Advanced Imaging Applications 3 hours.

Instruction in advanced line imaging and visualization for patient education, editorial and product, and diagnostic image interpretation. **Prerequisite(s):** BVIS 420 or consent of the instructor.

525

Animation and Multimedia 4 hours.

Production experiences in selected biomedical communications specialties: electronic print media, multimedia, animation, Web site design. Guest instructors with special expertise utilized wherever feasible. **Prerequisite(s):** BVIS 542 or consent of the instructor.

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.

Prerequisite(s): ANAT 441 and BVIS 420 and BVIS 430 and BVIS 440 and BVIS 450.

540

Computer Visualization 4 hours.

Construction of 3-D computer models of biological and anatomical structures using software models, 3-D input devices, and medical scans and data.

Prerequisite(s): 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 be used effectively. Involves production from concept to final presentation. **Prerequisite(s):** BVIS 415 and BVIS 540 and consent of instructor.

543

Computer Animation II 4 hours.

Builds on concepts introduced in BVIS 542—Computer Animation. Further investigation of motion using computer animation techniques to solve contemporary problems in medical education and communication where motion can effectively be used.

Prerequisite(s): BVIS 542 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. **Prerequisite(s):** BVIS 415 and BVIS 440.

546

Virtual Reality and Stereography in Biomedical Visualization 2 hours.

Introduction to 3-D perception; digital 3-D model creation; 3-D presentation methods; computer configuration for 3-D display; virtual reality in medicine.

Prerequisite(s): Consent of the instructor.

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(s):** BVIS 460.

554

Anaplastology Materials and Techniques 2 hours.

Hands-on experience with prosthetic materials and techniques. Emphasis on health and safety issues related to laboratory equipment and clinical procedures.

Prerequisite(s): AHS 420 and ANAT 441 and BVIS 460.

555

Clinical Anaplastology 4 hours.

Concepts of prosthetic rehabilitation. Provision of facial/somato prosthetic services in a multidisciplinary clinical setting requiring direct interaction with patients with disfigurements. Emphasis on prosthetic techniques and materials. **Prerequisite(s):** ANAT 441 and AHS 420 and BVIS 460 or consent of the instructor.

580

Practicum in Biomedical Visualization 2 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.

May be repeated. **Prerequisite(s):** Consent of the instructor.

594

Special Topics in Biomedical Visualization 1 TO 4 hours.

Selected topics in specialty areas of biomedical visualization, depending on sufficient student demand and faculty availability, such as pharmaceutical illustration and ocular prosthetic design. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595

Seminar in Biomedical Visualization 1 hour.

Topics of current interest in biomedical visualization. Includes discussion of current journal articles and important new developments in the field. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

596

Independent Study 1 TO 4 hours.

For students who wish to pursue independent study not related to their project research. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

597

Project Research 0 TO 5 hours.

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. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Consent of the instructor.

598

Research in Biomedical Visualization 0 TO 16 hours.

Independent research in biomedical visualization directed by a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Foundation

courses in research and statistics, or consent of instructor.

Biopharmaceutical Sciences (BPS)

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(s):** PHAR 403 and PHAR 404; or consent of the instructor.

430

Principles of Toxicology 2 hours.

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. **Same as** PCOL 430. Credit is not given for BPS 430 if student has credit for EOHs 457.

470

Clinical Pharmacology I 1 hour.

Basic principles of clinical pharmacology/toxicology including clinical trial design, statistical interpretation, pharmacokinetics, drug interactions (side effects) as well as basic mechanisms involved in the above. **Prerequisite(s):** Open only to students with third-year professional standing in the Doctor of Pharmacy program or with graduate standing.

471

Clinical Pharmacology II 1 hour.

Basic principles of clinical pharmacology applied to critical analysis of patient case histories in major disease states and FDA requirements. **Prerequisite(s):** BPS 470.

480

Application of Science to the Law 4 hours.

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. **Same as** CRJ 480.

Prerequisite(s): CRJ 210 and CRJ 260; or graduate standing.



494
Special Topics of Current Interest in Biopharmaceutical Sciences 1 TO 3 hours.
Courses offered by faculty or a visiting lecturer on a current topic of selected interest. Topics are available on an experimental basis for one offering only. May be repeated to a maximum of 6 hours.
Prerequisite(s): Consent of the instructor; good academic standing as defined by UIC policies.

501
Biopharmaceutical Sciences I 4 hours.
First part of the fundamental didactic core courses in biopharmaceutical sciences, including fundamental principles of pharmaceuticals, pharmacokinetics, scientific ethics, and research design. **Prerequisite(s):** Graduate standing in the biopharmaceutical sciences program; or approval of the department.

502
Biopharmaceutical Sciences II 4 hours.
Second part of fundamental didactic core courses in biopharmaceutical sciences; fundamental principles of cell and molecular biology and pharmacogenomics, pharmacodynamics including toxicology, research communication, and regulatory processes.
Prerequisite(s): BPS 501; and graduate standing in the biopharmaceutical sciences program; or approval of the department.

503
Laboratory Techniques in Biopharmaceutical Sciences 3 hours.
Laboratory-based core course in methods and techniques employed in biopharmaceutical sciences research. Credit is not given for BPS 503 if the student has credit for PMPD 500. **Prerequisite(s):** BPS 502 or consent of the instructor.

506
Industrial Experience 4 TO 10 hours.
Recommended to graduate students with no industrial experience. Students spend time working in the pharmaceutical, imaging or cosmetic industry under academic supervision to obtain practical experience. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** BPS 501 and BPS 502 and BPS 503 and BPS 510 and BPS 515 and BSTT 400 and GC 401 and GC 470 and GC 471 and BCHE 460.

507
Drug Discovery, Design, and Development 3 hours.
Overview of drug development process from target identification and screening through clinical trials and FDA evaluation. **Same as** MDCH 507 and PMPG 507.

510
Principles of Interfacial Phenomena 3 hours.
Quantitative and theoretical principles of physical and chemical sciences as applied to pharmacy, thermodynamics, kinetics, colloid, and surface chemistry in evaluation of pharmaceutical formulations.
Prerequisite(s): MATH 480.

515
Dissolution and Bioavailability of Dosage Forms 2 hours.
Theories and testing of the release of drug from solid dosage forms, including the effect of dissolution rate on bioavailability.
Prerequisite(s): PHAR 323; and approval of the department.

518
Controlled Drug Delivery 3 hours.
Controlled drug delivery systems utilizing polymers, synthesis of different types of devices, the delivery expected from these devices, and mathematical modeling of delivery systems. **Same as** BIOE 518. **Prerequisite(s):** MATH 220 or approval of the department.

519
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(s):** Consent of the instructor.

520
Lipid-Based Drug Delivery Systems 2 hours.
The preparation, characterization, stability, pharmaceutical cosmetic and diagnostic applications of lipid-based drug delivery systems, including liposomes, micelles, and emulsions prepared with phospholipids. **Prerequisite(s):** PHAR 323; and approval of the department.

522
Principles of Polymeric Science and Engineering 3 hours.
Intermediate polymer science, thermodynamics of polymer solutions, phase separations, MW determination, crystallization, elasticity, kinetics, and processing. **Same as** BIOE 522. **Prerequisite(s):** MATH 220 or consent of the instructor.

540
Topics in Adverse Drug Reactions 2 hours.
Advanced treatment of current adverse drug reaction incidents, involving evaluation of the issues.
Prerequisite(s): Consent of the instructor.

542
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. **Prerequisite(s):** Consent of the instructor and a course in basic pharmacology.

543
Psychoneuro-immunology 2 hours.
The interactions between the immune system, the endocrine system, and the central nervous system specifically as they relate to stress and immunity.

544
Immunotoxicology 2 hours.
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(s):** Consent of the instructor.

545
Advanced Pharmacokinetics 3 hours.
Kinetics of absorption, distribution, metabolism, and excretion of drugs factors affecting these kinetics and their relationship to pharmacodynamics. **Prerequisite(s):** Consent of the instructor.

551
Pharmacological Basis of Therapeutics I 2 hours.
Pharmacological basis of drugs for the treatment of diseases, including cancer, and conditions, such as inflammation of the nervous and gastrointestinal systems.
Prerequisite(s): Credit or concurrent registration in BCHE 460 and BPS 502; or approval of the department.

552
Pharmacological Basis of Therapeutics II 2 hours.
Pharmacological basis of drugs for treatment of diseases, including cancer, and conditions, such as inflammation of the cardiovascular, renal, and endocrine systems.
Prerequisite(s): BPS 551; or approval of the department.

555
Principles of Pharmacogenomics 2 hours.
Concept and application of pharmacogenomics in disease diagnosis, prevention, and treatment.
Prerequisite(s): BPS 502 or consent of the instructor.

580
Forensic Science: Survey and Foundations 2 hours.
Survey course for forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, pattern evidence. **Same as** CRJ 580. **Prerequisite(s):** Approval of the department.

581
Forensic Analysis of Biological Evidence 4 hours.
Forensic blood and physiological fluid identification; DNA typing of biological evidence; report writing; expert testimony. **Prerequisite(s):** Consent of the instructor.

582
Forensic Chemistry and Trace Evidence Analysis 4 hours.
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(s):** Consent of the director of graduate studies.

583
Physical Pattern Evidence Analysis 4 hours.
Pattern evidence: individualization, reconstruction; fingerprint classification; questioned documents; handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction will be studied in depth. **Prerequisite(s):** Consent of the instructor.

584
Forensic Drug Analysis and Toxicology 4 hours.
Analysis of commonly abused drugs in their solid-dosage form and in biological media with



emphasis on modern instrumental methods and interpretation of results. **Prerequisite(s):** Consent of the instructor.

586

Topics in Specialty Forensic

Examinations 1 TO 4 hours. Topics may vary but will revolve around specialty forensic examinations, covering specific evidentiary classes (e.g. drug identification, DNA typing, fingerprints), including forensic laboratory methods, approaches, and data interpretation. May be repeated if topics vary. Students may register in more than one section per term.

Prerequisite(s): BPS 581 or BPS 582 or BPS 583 or BPS 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

588

Expert Witness Testimony and Courtroom

Demeanor 3 hours. Trials, hearings, grand jury; expert versus lay witness; personal and behavioral characteristics on the stand; results, reports and courtroom testimony; simulated trial testimony. **Prerequisite(s):** Approval of the department.

589

Special Topics in

Forensic Science 3 hours. Content may vary but will revolve around the philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to noncriminalistics fields. **Same as CRJ 589.** May be repeated if topics vary. **Prerequisite(s):** Consent of the instructor.

590

Forensic Science

Residency 3 hours. In-depth training for casework analysis in a specific forensic discipline (e.g. drug identification, DNA typing, fingerprints) in an approved forensic science laboratory. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours.

Prerequisite(s): BPS 581 or BPS 582 or BPS 583 or BPS 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

591

Topics in Forensic

Microscopy 1 TO 4 hours. Topic may vary but will revolve around microscopical characteriza-

tion of various materials, with emphasis on forensic laboratory methods and approaches, and interpretation of materials comparisons as evidence. May be repeated if topics vary. Students may register in more than one section per term. **Prerequisite(s):** BPS 582 and consent of the instructor.

592

Forensic Science

Internship 2 TO 4 hours. 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. May be repeated to a maximum of 4 hours. Students may register in more than one section per term.

Prerequisite(s): BPS 580; and consent of the instructor and a minimum of 15 hours of credit earned in the MS in Forensic Science program.

593

Research in

Biopharmaceutical Sciences 0 TO 16 hours. Research in biopharmaceutical sciences with the guidance of a faculty mentor. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Approval of the department.

594

Special Topics in Biopharmaceutical Sciences

1 TO 4 hours. Content varies. Special topics in biopharmaceutical sciences not covered in regular core or elective offerings. May be repeated to a maximum of 4 hours if topics vary. **Prerequisite(s):** Consent of the instructor.

595

Departmental

Seminar 1 TO 2 hours. Weekly seminar series on research and experimental techniques in biopharmaceutical sciences. Also consists of journal club at which students will present an article once a year. Satisfactory/Unsatisfactory grading only. May be repeated. Weekly seminar and journal club meet separately from one another. **Prerequisite(s):** Approval of the department.

596

Independent Study in Forensic

Science 1 TO 8 hours. Supervised projects may consist of extensive reading or laboratory work, or both, on topics not covered in regular course offerings. Research undertaken for this course may not duplicate that

being done for BPS 597 or BPS 598. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

597

Forensic Science

Project Research 3 hours. Supervised research in forensic science; a research project to be designed and completed within one semester. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): BPS 580; and at least the core course in the MS in Forensic Science program covering the subject area in which the research is to be conducted and consent of the instructor.

598

MS Thesis

Research 0 TO 16 hours. For students doing MS thesis research or thesis writing. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 10 hours. A minimum of 6 hours is required. **Prerequisite(s):** Consent of the instructor.

599

Dissertation

Research 0 TO 16 hours. PhD thesis research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Biostatistics (BSTT)

400

Biostatistics I 3 hours. Descriptive statistics, basic probability concepts, one- and two-sample statistical inference, analysis of variance, and simple linear regression. Introduction to a statistical computer package such as Minitab or SAS. Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate 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, nonparametric methods, logistic regression, analysis of categorical data; extensive use of computer software. **Prerequisite(s):** 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 lifetables using SAS.

Prerequisite(s): BSTT 401.

410

Introduction to Statistical Computing

1 hour. Application of statistical packages for appropriate statistical analysis and interpretation. Students will use computers for homework assignments. **Prerequisite(s):** Credit or concurrent registration in BSTT 400.

430

Design of

Clinical Trials 3 hours. Rationale for clinical trials, blinding, ethical issues, methods of randomization, crossover trials, power and sample size calculations, data management, protocol deviation, data analysis, interim analysis.

Prerequisite(s): BSTT 401 or the equivalent and EPID 401 and consent of the instructor.

440

Sampling and Estimation Methods Applied to

Public Health 3 hours. Major sampling designs and estimation procedures used in the conduct of sample surveys with emphasis on topics relevant to the health sciences. Credit is not given for BSTT 440 if the student has credit in STAT 431. Restriction applies only to certification for students pursuing the Interdepartmental Graduate Concentration in Survey Methodology. **Prerequisite(s):** BSTT 401 or BSTT 502 or consent of the instructor.

494

Introductory

Special Topics in Biostatistics 1 TO 4 hours. Special topics in biostatistics. Content varies. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

502

Biostatistics Methods I

4 hours. Foundations for and introduction to statistical inference, including one- and two-sample problems; regression analysis, including multiple regression and indicator variables. **Prerequisite(s):** College calculus, including multivariable calculus, concurrent registration in BSTT 503, and consent of the instructor.

503
Biostatistics
Laboratory 2 hours.
Use of spreadsheets for statistical investigations; use of statistical software; matrix theory, including methods relevant in biostatistical analysis. **Prerequisite(s):** Concurrent registration in BSTT 502 and consent of the instructor.

504
Biostatistics
Methods II 4 hours.
Analysis of variance and multiple comparisons; model building and diagnostics; generalized linear models; logistic and Poisson regression; introduction to repeated measures and mixed models. **Prerequisite(s):** BSTT 502 and BSTT 503, or consent of the instructor.

511
Categorical
Data Analysis 3 hours.
Contingency tables and their tests, measures of association, stratified analysis, logistic regression, generalized linear model, Poisson regression, log-linear model, matched data, marginal homogeneity, ordinal data. **Prerequisite(s):** BSTT 504 and STAT 411, or consent of the instructor.

512
Survival Analysis 3 hours.
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(s):** BSTT 504 and STAT 411, or consent of the instructor.

513
Longitudinal
Data Analysis 4 hours.
Application and theory of models for longitudinal data analysis for both continuous and categorical response data, including use of statistical software for these methods. **Prerequisite(s):** STAT 411 and BSTT 504, or consent of the instructor.

514
Biostatistical
Consulting 2 hours.
Discussion of techniques required for successful biostatistical consultation; effective communication, problem formulation, data analysis, oral and written reports, supervised consulting experience. **Prerequisite(s):** BSTT 504 and consent of the instructor. Restricted to students enrolled in the Biostatistics major.

521
Applied Multivariate
Analysis 3 hours.
Analysis of vector of responses; MANOVA, data reduction methods; introduction to cluster analysis, discriminant analysis, and structural equation models. **Prerequisite(s):** BSTT 513 and consent of the instructor.

522
Biostatistical
Investigations 4 hours.
Analysis of several large data sets that will require integration of numerous biostatistical tools; written summarization and discussion of results. **Prerequisite(s):** BSTT 511 and BSTT 512 and BSTT 513 and BSTT 514; and concurrent registration in BSTT 521.

531
Advanced Statistical
Inference 3 hours.
An in-depth consideration of some important ideas of statistical inference including large-sample theory, estimation, and testing. Specific topics to be covered include asymptotic theory, parameter estimation methods, and hypothesis testing. Some computer use in class. **Prerequisite(s):** Consent of the instructor. Open only to PhD degree students. **Recommended background:** MS degree in Biostatistics or the equivalent.

533
Linear Models 4 hours.
Generalized inverse matrices; distributions for quadratic forms; estimability and testable hypotheses; constrained linear model; applications to regression, ANOVA, ANCOVA models; variance component models. **Prerequisite(s):** Consent of the instructor. Open only to PhD degree students. **Recommended background:** MS degree in Biostatistics or the equivalent.

594
Special Topics in
Biostatistics 1 TO 4 hours.
Advanced special topics. Content varies. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595
Biostatistics
Research Seminar 1 hour.
Current developments in theory and application of biostatistics and epidemiology with presentations by faculty and visiting scientists. Satisfactory/Unsatisfactory grading only. May be repeated.

Business Administration (BA)

589
Corporate Business
Internship
Program 0 TO 3 hours.

Corporate business internship provides graduate students an opportunity to gain practical work experience in their field of study and to test their career choice. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. No graduation credit for students in the following: MS in Accounting or MS in Management Information Systems. **Prerequisite(s):** Consent of the director of the Business Career Center. Approval by the director of graduate studies prior to registration is required for students in the MS in Accounting and MS in Management Information Systems programs.

594
Special Topics in
Business
Administration 1 TO 4 hours.

An intensive study of a selected topic in business administration. Topics vary by section and by term. May be repeated to a maximum of 16 hours if topics vary. Students may register in more than one section per term. **Prerequisite(s):** Consent of the graduate business program adviser.

Chemical Engineering (CHE)

410
Transport
Phenomena 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): CHE 312 or consent of the instructor.

413
Introduction
to Flow in
Porous Media 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): CHE 312 or consent of the instructor.

421
Combustion
Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CHE 301 and CHE 321.

422
Biochemical
Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Consent of the instructor.

423
Catalytic
Reaction
Engineering 3 OR 4 hours.

Catalytic reactions which occur under conditions for which heat and mass transfer cannot be neglected are considered. Includes porosimetry, surface area measurements and catalyst deactivation. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): CHE 321 or consent of the instructor.

431
Numerical Methods in
Chemical
Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Graduate or advanced undergraduate standing.

438
Computational
Molecular
Modeling 3 OR 4 hours.

Provide students with a fundamental understanding of the methods, capabilities, and limitations of molecular simulations. 3 undergraduate hours. 4 graduate hours. Extensive computer use required.

Prerequisite(s): CHE 301.
Recommended background: Engineering/science.

440
Non-Newtonian
Fluids 3 OR 4 hours.

Fluid mechanics and transport processes involving non-Newtonian fluids. Purely viscous and viscoelastic behavior. Viscometric functions and rheometry. Heat and mass transfer in non-Newtonian fluids.



3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CHE 410 or consent of the instructor.

441 Computer Applications in Chemical Engineering 3 OR 4 hours.

Nonnumerical applications of computers: artificial intelligence and expert systems for chemical engineering design and online diagnosis; data acquisition and control for digital process control; process design calculations. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Senior standing in chemical engineering.

445 Mathematical Methods In Chemical Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): MATH 220 or the equivalent.

450 Air Pollution Engineering 4 hours.

Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control.

Fundamentals of combustion.

Same as ME 450.

Prerequisite(s): ME 321 or consent of the instructor.

456 Fundamentals and Design of Microelectronics Processes 3 OR 4 hours.

Design and practical aspects of the most advanced state of micro and nanoelectronics processing with emphasis on thin film deposition, substrate passivation, lithography and etching with thermodynamics, kinetics, reactor design, and optimization. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** Graduate standing or consent of the instructor. **Recommended background:** Engineering/science.

494 Selected Topics in Chemical Engineering 1 TO 4 hours.

Systematic study of selected topics in chemical engineering theory and practice. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** 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(s):** CHE 301 or 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(s):** 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(s):** CHE 502.

510 Separation Processes 4 hours.

Advanced coverage of equilibrium stage separation. Multicomponent separation and distillation; unsteady state adsorption processes. Separation efficiencies and energy requirements. **Prerequisite(s):** 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(s):** 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(s):** CHE 410 and CHE 445 or consent of the instructor.

514 Biotransport 4 hours.

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.

Same as BIOE 514.

Prerequisite(s): CHE 410 or consent of the instructor.

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(s): Consent of the instructor.

527 Advanced Chemical Reaction Engineering 4 hours.

Multiplicities in chemically reacting systems nonideal reactors: effects of residence time distribution and mixing history. Heterogeneous non-catalytic reactions: gas-liquid, liquid-liquid, and solid-fluid systems. Heterogeneous catalytic reactions.

Prerequisite(s): 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(s): CHE 505.

592 Specialized Problems 4 TO 8 hours.

Specialized problems under faculty supervision. **Prerequisite(s):** Consent of the instructor.

594 Advanced Topics in Chemical Engineering 1 TO 4 hours.

Systematic study of advanced topics in chemical engineering theory and practice. Subjects vary from year to year. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 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(s): Graduate standing in chemical engineering.

597 Project Research 0 TO 4 hours.

A research design or reading project approved by the committee appointed by the director of graduate studies. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Recommended background: Completed required classes in curriculum.

598 MS Thesis Preparation 0 TO 16 hours.

Individual research in specialized problems under faculty supervision. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

599 PhD Thesis Preparation 0 TO 16 hours.

Individual research in specialized problems under faculty supervision. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Chemistry (CHEM)

414 Inorganic Chemistry I 3 OR 4 hours.

Introduction to the principles of inorganic chemistry. Structural and descriptive chemistry of the main-group elements. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): 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 infrared and UV-visible spectroscopy, crystal growth.

Prerequisite(s): Credit or concurrent registration in CHEM 414.

416 Inorganic Chemistry II 3 OR 4 hours.
Structural and descriptive chemistry of the transition elements. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 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. **Prerequisite(s):** CHEM 222 and CHEM 343 or the equivalent.

432 Intermediate Organic Chemistry 2 OR 3 hours.
Rigorous treatment of the principles upon which modern organic chemistry is developed. 2 undergraduate hours. 3 graduate hours. **Prerequisite(s):** CHEM 235 and CHEM 342.

444 Physical Chemistry III 2 OR 3 hours.
Application of quantum mechanics to molecular spectroscopy, statistical mechanics and activated complex theory. 2 undergraduate hours. 3 graduate hours. **Prerequisite(s):** CHEM 346.

448 Statistical Thermodynamics 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CHEM 346.

452 Biochemistry I 4 hours.
Chemistry of proteins, nucleic acids, carbohydrates, and lipids. **Same as** BIOS 452. **Prerequisite(s):** Credit or concurrent registration in CHEM 234.

454 Biochemistry II 4 hours.
Continues BIOS 452. Carbohydrate and lipid metabolism, electron transport. Metabolism of amino acids, nucleic acids, proteins. Biosynthesis of macromolecules and regulation of macromolecular synthesis. **Same as** BIOS 454. **Prerequisite(s):** BIOS 452 or CHEM 452.

455 Biochemistry Laboratory 3 hours.
Introduction to modern biochemistry and molecular biology research. Includes recombinant DNA techniques, protein purification, site-directed mutagenesis, polymerase chain reaction, enzyme kinetics, protein structure data analysis, and molecular graphics. **Prerequisite(s):** CHEM 222 and CHEM 452.

456 Natural Products 3 OR 4 hours.
Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. **Same as** BIOS 416. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One year of organic chemistry.

470 Educational Practice with Seminar I 6 hours.
The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

471 Educational Practice with Seminar II 6 hours.
The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in CHEM 470, and approval of the department.

472 Teaching Methods in Chemistry 0 TO 4 hours.
A course in the methods of teaching high school chemistry, including laboratory and the integration of technology. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** 24 semester hours of undergraduate chemistry including two semesters of laboratory chemistry. **Recommended background:** ED 210 and physical chemistry I.

474 Teaching Chemistry in High Schools 1 hour.
Modern ways to help beginning learners construct in their own minds an understanding of scientific concepts and scientific method. Emphasis on the concepts of chemistry. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Approval of the department.

488 Cooperative Chemistry Practice 1 hour.
Off-campus participation in a governmental or industrial training program. Credit is contingent on the submission of a final report. Satisfactory/Unsatisfactory grading only. May be repeated. A maximum of 6 hours of CHEM 488, CHEM 492, and CHEM 499 combined may be credited toward departmental undergraduate degree course requirements. **Prerequisite(s):** Concurrent registration in LAS 289 or consent of the instructor.

492 Independent Study 1 TO 2 hours.
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. Satisfactory/Unsatisfactory grading only. May be repeated. A maximum of 6 hours of CHEM 488, CHEM 492, and CHEM 499 combined may be credited toward departmental undergraduate degree course requirements. **Prerequisite(s):** 2.50 grade point average in science courses and consent of the instructor.

494 Special Topics in Chemistry 1 TO 4 hours.
Course content is announced prior to each term in which the course is given. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

499 Supervised Research 3 hours.
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. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. A maximum of 6 hours of CHEM 488, CHEM 492, and CHEM 499 combined may be credited toward departmental undergraduate degree course requirements. **Prerequisite(s):** Junior standing

or above, approval of the department, consent of the instructor and a grade point average of 2.50 in science courses; or graduate standing. **Recommended background:** Credit in CHEM 235 or CHEM 314.

500 Faculty Research 1 hour.
Mandatory for first-year students. Faculty present their research interests to new graduate students. Satisfactory/Unsatisfactory grading only.

510 Literature Seminar in Inorganic Chemistry 1 hour.
Discussion of inorganic research from the current literature. Emphasis on student presentations. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Graduate standing or consent of the instructor.

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(s):** CHEM 416 or the equivalent.

516 Advanced Inorganic Chemistry II 4 hours.
Structural and descriptive chemistry of the transition elements; spectroscopy and magnetism. **Prerequisite(s):** CHEM 416 or the equivalent.

518 Advanced Inorganic Chemistry III 4 hours.
Synthesis, structure, bonding, and properties of solid-state materials. **Prerequisite(s):** CHEM 416 or the equivalent or consent of the instructor.

519 Special Topics in Inorganic Chemistry 3 TO 4 hours.
Lectures on topics not represented in regularly scheduled courses. May be repeated. **Prerequisite(s):** Graduate standing or consent of instructor.

520 Literature Seminar in Analytical Chemistry 1 hour.
Discussion of analytical chemical research from the current literature. Emphasis upon student presentations. Satisfactory/Unsatisfactory grading only.



**522
Techniques in Mass Spectrometry and Surface Analysis 4 hours.**

Various methods in mass spectrometry. Nonoptical applied surface analysis, including X-ray photoelectron spectroscopy, Auger spectroscopy, and scanning probe microscopy. Instrumentation, applications, and data analysis.

Prerequisite(s): CHEM 421 or the equivalent.

**524
Optical Spectroscopies in Analytical Chemistry 4 hours.**

Theory and experimental methods in infrared, ultraviolet, and visible spectroscopies, both absorption and emission. **Prerequisite(s):** CHEM 346 and CHEM 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(s): CHEM 346 and CHEM 421; or the equivalent or consent of the instructor.

**528
Chemical Separations 4 hours.**

Fundamentals and recent advances in techniques and technologies for the separation of chemical substances, including both chromatographic and electrophoretic methods. Special emphasis on trace and microscale methods.

Prerequisite(s): CHEM 421 or approval of the department.

**529
Special Topics in Analytical Chemistry 3 TO 4 hours.**

Lectures and readings in areas not normally treated in standard courses. Discussion of topics of current interest in analytical chemistry. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

**530
Literature Seminar in Organic Chemistry 1 hour.**

Discussion of organic chemical research from the current literature. Emphasis upon student presentations. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

**531
Spectroscopic Organic Structure Determination 3 hours.**

Discussion of principles and modern practice in the elucidation of the structures of organic molecules using NMR, IR, UV, and mass spectrometry. With practical examples.

Prerequisite(s): CHEM 234 or the equivalent.

**532
Advanced Organic Chemistry I 4 hours.**

Introduction to advanced organic chemistry drawing molecules and mechanisms, FMO theory, stereochemistry conformational analysis, stereoelectronic effects, selected functional group interconversions. Some computer use will be required. **Prerequisite(s):** CHEM 432 or the equivalent.

**533
Advanced Organic Chemistry II 4 hours.**

Continues CHEM 532. Chemical literature, chemical bonding, pericyclic reactions, physical organic chemistry, reactive intermediates, organic reaction mechanisms with an emphasis on physical principles.

Prerequisite(s): CHEM 532 or the equivalent.

**534
Advanced Organic Chemistry III 4 hours.**

Continues CHEM 533. The major reactions in organic chemistry and their uses in organic synthesis.

Prerequisite(s): CHEM 533 or the equivalent.

**535
Advanced Synthetic Chemistry 4 hours.**

Topics include: control of stereochemistry (cyclic + acyclic), synthesis of complex natural and unnatural products (such as alkaloids, terpenes) and new methodologies.

Prerequisite(s): 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(s): CHEM 533 or consent of the instructor.

**539
Special Topics in Organic Chemistry 3 TO 4 hours.**

Discussion of topics of current interest. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** CHEM 533.

**540
Current Problems in Physical Chemistry 1 hour.**

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. Satisfactory/Unsatisfactory grading only.

**542
Quantum Mechanics 4 hours.**

Exact solutions of the Schrodinger equation for simple systems; variational principle and perturbation theory; many-electron atoms and diatomic molecules and their electronic structures; angular momentum. **Prerequisite(s):** 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(s):** 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(s):** CHEM 542 or consent of the instructor.

**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(s):** Consent of the instructor.

**550
Literature Seminar in Biochemistry 1 hour.**

Presentation of student papers on current research topics in biochemistry. Satisfactory/Unsatisfactory grading only.

**551
Advanced Biochemistry I 4 hours.**

Basic and current topics on proteins, including protein structure, protein stability, protein folding and misfolding, and proteomics.

Prerequisite(s): CHEM 454; and CHEM 346 or CHEM 344.

**552
Chemical Biology 4 hours.**

Major trends and recent developments in research at the interface of chemistry and biology. **Same as** BIOS 552.

**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(s): CHEM 415 or CHEM 452.

**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(s):** CHEM 454.

**558
Biophysical Chemistry 4 hours.**

The role of molecular interactions in determining the structure and function of complex biological systems, and the use of modern experimental techniques to study these interactions and systems.

Prerequisite(s): CHEM 452 or consent of the instructor.

**559
Special Topics in Biochemistry 3 TO 4 hours.**

Selected topics of current interest in biochemistry. **Same as** BIOS 559. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** CHEM 454 or BIOS 454 or consent of the instructor.

**572
Teaching Methods in Chemistry 3 hours.**

Special problems and techniques, including audiovisual methods, lecture demonstrations, the use of computers, and the design of experiments. May be repeated. A maximum of 3 hours may be credited toward departmental course requirements for the MS or PhD in Chemistry. **Prerequisite(s):** Approval of the department.

**590
Current Problems in Chemical Research 2 hours.**

In-depth discussion and analysis of selective aspects of contemporary research with particular emphasis on research carried out in the department. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of instructor.





598
Master's Thesis
Research 0 TO 16 hours.
Master's thesis work under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated.
Prerequisite(s): Approval of the department.

599
PhD Thesis
Research 0 TO 16 hours.
PhD thesis work under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated.
Prerequisite(s): Approval of the department.

Civil and Materials Engineering (CME)

400
Advanced Design of Reinforced Concrete Structures 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 310 or the equivalent.

401
Advanced Design of Metal Structures 3 OR 4 hours.
Plate girders; unsymmetrical bending; torsion of thin-walled structures; lateral-torsional instability; composite construction. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 301.

402
Geometric Design of Highway Facilities 3 OR 4 hours.
Elements of geometric design. Driver, vehicle, and roadway system characteristics. Horizontal and vertical alignment design. Intersection design and operation. Capacity and level of service. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 302.

403
Hydraulic Design 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 215.

405
Foundation Analysis and Design 3 TO 4 hours.
Site characterization; analysis and design of shallow foundations, deep foundations and earth retaining structures; foundations on difficult soils; effects of construction; instrumentation and monitoring. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 315.

406
Bridge Design 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 301 and CME 310.

407
Soil and Site Improvement Methods 3 OR 4 hours.
Compaction, preloading, vertical drains, grouting, admixture stabilization, thermal stabilization, soil reinforcement, geosynthetics; construction of embankments on soft clay, embankments on mechanically stabilized earth walls, hydraulic barriers; case studies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 315.

408
Traffic Engineering and Design 3 OR 4 hours.
Highway traffic control with an emphasis on highway capacity analysis and traffic signal design. Queuing theory, traffic flow theory, corridor management, and traffic safety. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. Fieldwork required.
Prerequisite(s): CME 302 or consent of the instructor.

409
Structural Analysis II 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 205 or consent of the instructor.

410
Design of Prestressed Concrete Structures 3 OR 4 hours.
Principles of prestressed concrete. Analysis and design of statically determinate prestressed concrete members. Introduction to design and detailing of connections. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 310.

411
Chemistry for Environmental Professionals 3 hours.
Introductory atmospheric chemistry, aspects of air pollution, chemistry related to natural water and water treatment; priority organic pollutants and heavy metals. **Same as** EOHS 440. **Prerequisite(s):** One year of college chemistry.

415
Environmental Geotechnology 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 315.

419
Air Quality Management I 3 hours.
Sources, control, dispersion, and effects upon receptors of air pollution: health and other adverse effects, meteorology and dispersion estimation, photochemistry aerosol characterization. **Same as** EOHS 431. **Prerequisite(s):** EOHS 405 or CME 216 or consent of instructor.

420
Water and Wastewater Analysis Laboratory 0 TO 4 hours.
Laboratory class for environmental engineering. Analysis of water, wastewater, and soil for nutrients, pollutants, physical parameters, and biological parameters. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 216; or graduate standing.

421
Water Treatment Design 3 OR 4 hours.
Water quality control systems. Physical-chemical unit processes applied to systems designed for treatment of municipal and industrial waters. 3 undergraduate hours. 4 graduate hours. Field trip required at nominal fee. **Prerequisite(s):** CME 216.

422
Biological Wastewater Treatment Design 3 OR 4 hours.
Processes involved in the biological treatment of wastewater. Aerobic and anaerobic treatment, sludge stabilization, and nutrient removal. 3 undergraduate hours. 4 graduate hours. Field trip required at nominal fee. **Prerequisite(s):** CME 216 or the equivalent.

423
Management of Solid and Hazardous Wastes 3 hours.
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. **Same as** EOHS 472 and GEOG 444.

425
Environmental Remediation Engineering 3 OR 4 hours.
Sources of contamination, regulations, site characterization, impact assessment, waste disposal and containment options, waste treatment options, case studies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 315.

427
Engineering Hydrology 3 OR 4 hours.
Processes, techniques, and concepts in hydrology of interest to the engineer: precipitation, interception, evaporation, groundwater, unit hydrographs, flood routing, and statistics. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 215.

430
Theory of Elasticity I 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CME 204 and MATH 481 or the equivalents.

431
Introduction to Continuum Mechanics 3 OR 4 hours.
Vectors and tensors, stress, principal stresses and principal axes, deformation, compatibility conditions, constitutive equations, isotropy and mechanical properties of fluids and solids. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 203 and CME 211; or CME 203 and ME 211.



432 Energy Methods in Mechanics 3 OR 4 hours.
Variational theorems of elasticity. Applications to establish approximate systems and their solution. Beams (including shear deformation). Introduction to instability theory. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 205.

433 Fracture Mechanics and Failure Analysis I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 430.

434 Finite Element Analysis I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 205 or ME 401 and CS 108.

435 Theory of Vibrations I 3 OR 4 hours.
Analytical and numerical treatment of linear, discrete systems. Nonlinear discrete systems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 200 or the equivalent and MATH 220.

450 Probability and Reliability in Structural Design 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Consent of the instructor.

453 Experimental Stress Analysis 0 TO 4 hours.
Structural similitude and dimensional analysis. Strain measurement techniques. Introduction to photoelasticity. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 430.

454 Structural Analysis and Design of Tall Buildings 3 OR 4 hours.
State-of-the-art introduction to structural analysis and design of tall buildings. Load impact on different structural systems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 401 or CME 409 or the equivalent, or consent of the instructor. **Recommended background:** Major structural analysis and design courses.

460 Crystallography and X-ray Diffraction 4 hours.
Fundamentals of crystallography. Theory of X-ray diffraction, experimental methods and applications. **Prerequisite(s):** CME 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(s):** CME 260.

471 Thermodynamics of Materials 0 TO 4 hours.
Application of chemical and thermodynamic principles to processing and characterization of materials. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 260.

480 Welding Metallurgy 4 hours.
Metallurgy of metals joining processes. Selection of processes and design of products manufactured by joining processes. **Prerequisite(s):** CME 368.

493 Seminar 1 TO 3 hours.
Topics of mutual interest to a faculty member and a group of students. Offered as announced in the *Schedule of Classes*.

494 Special Topics in Civil Engineering, Mechanics, and Materials 1 TO 4 hours.
Subject matter varies from section to section and from semester to semester, depending on the specialties of the instructor. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

496 Special Problems 1 TO 4 hours.
Special problems or reading by special arrangement with a faculty member. **Prerequisite(s):** 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(s):** CME 310.

501 Urban Transportation 4 hours.
Transportation technology and its relation to travel and location phenomena in large urban areas, as a basis for planning, operating and design of multimodal transportation systems. **Prerequisite(s):** Grade of C or better or concurrent registration in CME 302; and MATH 210 and ECON 120. **Recommended background:** For transportation and urban planning majors.

502 Bridge Design II 4 hours.
Theory and design procedures related to the analysis and design of modern bridges, using AASHTO Code. Includes concrete and steel structures, construction practices and procedures. **Prerequisite(s):** CME 406.

503 Advanced Transportation Demand Analysis 4 hours.
Advanced quantitative analysis and modeling of transportation demand for planning purposes. Disaggregate choice models, traveler behavior and values, activity-based and microsimulation approach to demand modeling. Extensive computer use required. **Prerequisite(s):** CME 508.

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(s):** CME 315.

506 Physical/Chemical Principles in Environmental Systems 4 hours.
Physical and chemical principles in natural and engineered environmental systems. Environmental process equilibria and rates. Reactor design and mass transfer in environmental systems. Multiphase environmental processes. **Prerequisite(s):** CME 216.

508 Urban Travel Forecasting 4 hours.
Theory and method of forecasting travelers' choices of route, mode, destination, departure time, trip frequency, and origin location in congested urban transportation networks. **Prerequisite(s):** CME 302 and MATH 210 and ECON 120.

509 Transportation Networks 4 hours.
Application of constrained optimization methods to the analysis, planning, and design of urban transportation networks. **Prerequisite(s):** CME 501 and ECON 501 and MATH 484 and CME 508.

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(s):** CME 410.

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(s):** CME 315.

518 Pollution Prevention Engineering 4 hours.
Pollution prevention concepts, planning, and economics. Improved manufacturing operations and life cycle assessment. Design for the environment, resource conservation and sustainable development. **Prerequisite(s):** CME 216.

520 Earthquake Engineering of Concrete Structures 4 hours.
Earthquake phenomena; response spectrum and design spectrum concepts; dynamic response of structures to earthquakes, methods of analysis; code approach to earthquake resistant design; alternative approaches. **Prerequisite(s):** CME 310.

521 Biological Treatment Fundamentals 4 hours.
Fundamental processes for the biological treatment of wastewater, pollutants, and bioremediation. Growth and metabolism, kinetics, microbial

ecology biogeochemistry, and pollutant biodegradation.

Prerequisite(s): Credit or concurrent registration in CME 422; or consent of the instructor.

Recommended background: A basic understanding of biology.

523

Environmental Organic Chemistry 4 hours.

Properties and behavior of environmental organic pollutants. Theory and estimation techniques.

Concepts of environmental fate assessment. Applications of fate models. **Same as** EOHS 543.

Prerequisite(s): EOHS 440 or CME 411.

524

Water Chemistry 4 hours.

Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. **Same as** EOHS 542. **Prerequisite(s):** EOHS 440 or CME 411.

525

Advanced Biological Treatment and Bioremediation 4 hours.

Advanced biological treatment processes. Stoichiometry of biological reactions, kinetics, bioremediation, biochemical pathways for pollutant biodegradation, immunological and genetic characterization of microbial cultures. **Prerequisite(s):** Credit or concurrent registration in CME 521; or consent of the instructor.

526

Air Quality Management II 2 hours.

Air quality management: integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. **Same as** EOHS 532. **Prerequisite(s):** EOHS 431 or CME 419.

530

Theory of Elasticity II 4 hours.

Review of complex variable theory. Complex variable formulation of plane problems. Singularities and crack problems. **Prerequisite(s):** CME 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(s): CME 430 or CME 431.

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(s): CME 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(s):** CME 434.

535

Theory of Vibrations II 4 hours.

Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; floquet waves; nonlinear vibrations. **Same as** ME 535. **Prerequisite(s):** CME 435 or ME 408 or the equivalent.

536

Nondestructive Testing of Concrete 4 hours.

Strength and durability of concrete structures by nondestructive evaluation of the material through acoustic, magnetic, thermal, electrical, and optical phenomena; nondestructive methodologies for evaluation of concrete structures. **Prerequisite(s):** CME 310.

537

Plasticity I 4 hours.

Basic postulates of plasticity. Yield condition and associated flow rules. Isotropic and kinematic hardening rules. Bounding problems. Finite element applications. Slip line theory.

539

Elastic Stability 4 hours.

Elastic stability of columns, beams, and frames. Limitations of elastic theory plastic buckling. Eigenproblems and their numerical solution. Elastic stability analysis by the finite element method.

Prerequisite(s): CME 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(s): CME 430 or equivalent.

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(s):** CME 434.

549

Subsurface Flow and Contaminant Transport Modeling 4 hours.

Definitions, basic principles, fluid flow in vadose zone, groundwater flow, contaminant transport in vadose zone, contaminant transport in groundwater, numerical models and field implementation, case studies. **Prerequisite(s):** CME 415 or consent of the instructor.

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. **Prerequisite(s):** CME 531 and CME 534; or consent of the instructor.

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(s):** Consent of the instructor.

570

Diffusion Phenomena in Materials 4 hours.

Diffusion mechanisms in crystals; Kirkendall effect; diffusion in ionic solids; diffusion in gases and liquids; diffusion through porous media; kinetics of diffusion controlled processes.

572

Advanced Thermodynamics of Materials 4 hours.

Treatment of multicomponent system thermodynamics with emphasis on metallurgical process applications. Development of relation between structure of metallic solutions, molten salts, and quasi-chemical models.

580

Infrastructure Management 4 hours.

Integrated approach to the management of infrastructure systems:

design, construction, operations, maintenance, and rehabilitation of facilities. Performance of facilities, approaches to management, and available tools and developing technologies. **Same as** UPP 569.

Prerequisite(s): IE 201 or the equivalent or consent of instructor.

Recommended background: Familiarity with computer spreadsheets.

594

Advanced Special Topics in Civil Engineering, Mechanics, and Materials 1 TO 4 hours.

596

Independent Study 1 TO 4 hours.

598

Master's Thesis Research 0 TO 16 hours.

MS thesis work under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

599

PhD Thesis Research 0 TO 16 hours.

PhD thesis work under the supervision of an adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Classics (CL)

401

Topics in Greek History 3 OR 4 hours.

Specific topics are announced each term. **Same as** HIST 401. 3 undergraduate hours. 4 graduate hours. May be repeated.

Prerequisite(s): 3 hours of history or classics.

402

Topics in Roman History 3 OR 4 hours.

Specific topics are announced each term. **Same as** HIST 402. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or classics.

404

Roman Law and the Civil Law Tradition 3 OR 4 hours.

Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. **Same as** CRJ 404 and HIST 404. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 200 or CL 203 or HIST 203 or consent of the instructor.





498
Special Topics in Classical Civilization 3 OR 4 hours.
Advanced study of topics in classical civilization. Sample topic: Augustus and his image. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. All readings are in English.
Prerequisite(s): Two classics courses at the 200-level.

499
Advanced Independent Study 3 OR 4 hours.
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. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Consent of the faculty member and department.

Committee on Institutional Cooperation (CIC)

500
Committee on Institutional Cooperation 0 TO 16 hours.
Holding course for UIC doctoral students taking approved course work at other institutions through the CIC Traveling Scholar Program. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Admission to a doctoral program and approval of the Graduate College.

Communication (COMM)

404
Discourse Analysis 3 OR 4 hours.
Nonverbal aspects of communication; rules of communication; speech acts; conversational coherences; acts and sequences in communication; marital communication patterns. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): COMM 304 or COMM 315 or COMM 416 or approval of the department.

410
Rhetorical Criticism 3 OR 4 hours.
Analysis and evaluation of critical standards for rhetorical interpretation. Application of critical standards to contemporary rhetorical events. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): COMM 312 and COMM 313; or approval of the department.

416
Conflict and Communication 3 OR 4 hours.
Students learn to manage and resolve conflict in business, governmental, and community settings. Practical analysis of interpersonal and group conflict cases. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): COMM 312 and COMM 313 and COMM 315; or approval of the department.

430
Media, Information, and Society 3 OR 4 hours.
News as a distinct form of mass communication, involving social functions and significant questions about facts, truth, knowledge, and values. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): COMM 103 and COMM 200; or COMM 300; or approval of the department.

434
Global Communication Systems 3 OR 4 hours.
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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): Approval of the department.

454
Cognitive Psychology of Language 3 hours.
Provides students with a survey of methods, theory and research in language and discourse processing.
Same as LING 474 and PSCH 454.
Prerequisite(s): Graduate standing or consent of the instructor.

456
Topics in the History of Communications 3 OR 4 hours.
This course introduces students to major developments in the history of communications, with a focus on the political and cultural dimension of technologies. **Same as** HIST 456. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): Consent of the instructor.
Recommended background: At least one history course at the 100-level.

467
Public Opinion and Political Communication 3 OR 4 hours.
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. **Same as** POLS 467. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): POLS 200 or the equivalent or consent of the instructor.

473
Organizations and Their Publics 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): COMM 201 and COMM 306; or approval of the department.

474
Internship 3 TO 8 hours.
Students work in an approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. May be repeated. Students may register in more than one section per term. A maximum of three hours may be counted toward the undergraduate communication major requirements. May not be counted toward the minimum Master of Arts degree requirements.
Prerequisite(s): 12 hours of upper-division courses in communication with a 3.00 grade point average in those courses; recommendation of two faculty members and approval of the department obtained in the semester prior to internship.

490
Seminar in Culture and Communication 3 hours.
Analysis of contrastive cultural paradigms (interethnic, gender, class) to develop student's awareness of own socialization and cultural orientation.
Prerequisite(s): COMM 301 plus any other 300-level communication course, or approval of department.

491
Seminar in Media and Communication 3 hours.
Analysis of contemporary or historical issues in mediated communication.
Prerequisite(s): COMM 301 plus any other 300-level communication course, or approval of department.

494
Special Topics in Communication 3 OR 4 hours.
Contemporary trends in the field of communication. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times.
Prerequisite(s): COMM 200 and COMM 201 and consent of the instructor; or approval of the department.

498
Independent Study 1 TO 4 hours.
Individual investigation of special problems (student-initiated or related to faculty research). May be used for special projects, such as interdisciplinary seminars. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. A maximum of 3 hours of credit may be applied toward the major in Communication. Credit earned may not be applied toward the minimum Master of Arts in Communication degree requirements.
Prerequisite(s): Senior standing and approval of the department.

500
Introduction to Communication Research 4 hours.
History of the field, research traditions, communication viewed as social science; forming research questions, reviewing and critiquing literature, formulating hypotheses and rationale, conceptually defining variables.
Prerequisite(s): Consent of the instructor or graduate standing in communication.

501
Operationalizing Communication Research 4 hours.
Levels of measurement; operational definitions; sampling qualitative and quantitative designs; coding and analysis of data; statistics; pilot testing and instrument/design revision; writing research reports.
Prerequisite(s): COMM 500.

502
Seminar in Media Studies 4 hours.
In-depth, intensive examination of theories, perspectives, and approaches to media studies.
Prerequisite(s): COMM 500; or consent of the instructor.

503
Seminar in Intercultural Communication 4 hours.
Introduction to basic theoretical concepts and important issues in intercultural communication.
Prerequisite(s): COMM 500 or consent of the instructor.

505
Organizational Communication 4 hours.
Classic and current research. Models that examine organizational communication; assessment of organizational problems and conduct of problem-solving research.
Prerequisite(s): COMM 306 and COMM 500; or consent of the instructor.

506

Cross-Cultural Communication 4 hours.

Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (interactional etiquette, discourse rules). **Same as** LING 506.

525

Approaches to Rhetorical Criticism 4 hours.

Contemporary approaches to rhetorical criticism. Each offering focuses upon the distinctive contributions of specified rhetoricians to the theory and practice of rhetorical criticism. May be repeated to a maximum of 12 hours.

Prerequisite(s): COMM 410.

534

Mass Communication Theory 4 hours.

Introduction to major theories of mass communication: their social history and substantive claims; distinction between mass mediated and other forms of communication, implications of distinction.

567

Topics in Political Communication 4 hours.

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. **Same as** PA 567 and POLS 567.

Prerequisite(s): Consent of the instructor.

580

Qualitative Methods in Communication 4 hours.

Qualitative methods course analyzing language and culture patterns. **Same as** LING 582.

Prerequisite(s): 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(s): 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.

Student may register for more than one section per term. Advanced topics in communication theory and

research. Subject matter varies. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

596

Independent Research 1 TO 4 hours.

Department approved research projects not included in thesis research. May be repeated to a maximum of 6 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the head of the department.

598

Thesis Research 0 TO 16 hours.

Under guidance of an adviser and committee the student develops and conducts a research project addressing a communication problem of a basic or applied nature.

Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** COMM 501.

Community Health Sciences (CHSC)

400

Public Health Concepts and Practice 3 hours.

Concepts, principles, discussions, exercises, and case studies that provide an overview of the philosophy, purpose, history organization, functions, tools, activities, and results of public health practice.

Prerequisite(s): Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate students admitted by consent as space permits. To obtain consent, see the SPH registrar.

401

Behavioral Sciences in Public Health 3 hours.

Provides grounding in the social and behavioral sciences to analyze public health issues. Includes analysis of individual, community, institutional, and societal factors influencing health and illness.

Prerequisite(s): Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate students admitted by consent as space permits. To obtain consent, see the SPH registrar.

403

The Future of Public Health 2 hours.

Examines the critical issues facing the public health system in the United States by considering concepts, issues, and recommenda-

tions of public health practice experts. **Recommended background:** Completion of CHSC 400.

405

Leadership in Public Health Practice 3 hours.

Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. **Same as** HPA 405. **Prerequisite(s):** CHSC 400 and consent of the instructor.

411

Nutrition for Public Health Professionals 3 hours.

Foundation course to introduce nutrition principles and their application to public health populations and problems. **Prerequisite(s):** CHSC 400; and graduate or professional standing; or consent of the instructor.

419

Public Health Aspects of Sexuality and Women's Health 3 hours.

An overview of human sexuality from a public health view with special emphasis on family planning, sexuality, and behavior effects on women's health. **Same as** GWS 419. **Prerequisite(s):** Graduate standing; or junior standing or above with consent of the instructor.

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 healthcare system.

431

Community Assessment in Public Health 3 hours.

An introduction to community assessment in health promotion.

Concepts and models of community health and community social dynamics: community participation and capacity building; strategies for situated inquiry and use of existing indicators; ethical issues. Fieldwork required. **Prerequisite(s):** Credit or concurrent registration in BSTT 400 and credit or concurrent registration in EPID 400 and credit or concurrent registration in CHSC 400 and 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.

Prerequisite(s): 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(s):** Credit or concurrent registration in CHSC 431 and credit or concurrent registration in CHSC 480; or consent of the instructor.

434

Introduction to Qualitative Methods in Public Health 3 hours.

Introduction to the major techniques used in qualitative research (observation, participant observation, in-depth interviews). Includes field and in-class exercises, and introduces computer-assisted qualitative data analysis.

441

Introduction to Maternal and Child Health 3 hours.

Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. **Same as** GWS 441. **Prerequisite(s):** Consent of the instructor.

Recommended background: Some knowledge of maternal and child health issues.

446

Research Methods in Community Health 3 hours.

Introduction to principles and techniques for scientific investigation of problems in public health research and practice. **Prerequisite(s):** BSTT 400 or the equivalent. Restricted to graduate or professional standing, or consent of the instructor.

447

Survey Planning and Design 3 hours.

Theory and applications of sample survey planning and design for conducting research in health sciences and related fields. Addresses three major topics: survey design and planning, sampling, and data collection procedures. **Same as** PA 447. **Prerequisite(s):** Graduate or professional standing and BSTT 400 or the equivalent. **Recommended background:** Credit in CHSC 446 or the equivalent.

450

Introduction to International Health 3 hours.

Survey of health conditions focus-



ing on Third World issues including consequences of population trends, disease prevalence, prevention/control, and technology transfer in socioeconomic context.

456 Women's Health: A Primary Healthcare Approach 3 hours.

Health promotion and disease prevention in women's health. Includes community experience with community women. Primary healthcare approaches examined. **Same as** NUSC 455 and NUWH 455.

Prerequisite(s): Consent of the instructor.

464 Survey of Developmental Disabilities 3 hours.

Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research.

Same as DHD 464.

Prerequisite(s): Graduate standing or consent of the instructor.

480 Health Education and Health Promotion 3 hours.

Theories of health education and health promotion for public health professionals; approaches for individual, group, and community-level behavior change. **Prerequisite(s):** Graduate or professional standing. Priority enrollment given to students in the division of Community Health Sciences within the School of Public Health. **Recommended background:** For CHSC students, CHSC 401 is recommended as a prerequisite.

485 Communications, Mass Media, and Public Health 3 hours.

Examines the development, theoretical bases, and assessments of mass media interventions, and the intended and unintended effects of the mass media in society.

494 Special Topics in Community Health Sciences 1 TO 4 hours.

Study of topics in maternal and child health, gerontology, behavioral science of health and illness, international health, community health, and public health practice. May be repeated. Students may register in more than one section per term. Topics vary by semester.

Prerequisite(s): Consent of the instructor. Restricted to graduate or professional standing, or 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.

Prerequisite(s): CHSC 400 and 8 semester hours in student's major field.

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.

Prerequisite(s): CHSC 411 or EPID 403 or consent of the instructor.

526 Family Perspectives on Disability 3 hours.

Examines trends, theories and research methods, policies, and family-centered intervention approaches for families of persons with disabilities. **Same as** DHD 526 and DIS 526. **Prerequisite(s):** Consent of the instructor.

527 Critical Issues in Long-Term Care Policy 3 hours.

Long-term care organization, financing, delivery utilization, and policy, emphasizing affordability, access, and quality in a managed care environment. **Same as** HPA 527.

Prerequisite(s): CHSC 400 and CHSC 425; or consent of the instructor.

528 Societal Analysis of Aging, Health, and Healthcare 3 hours.

Analysis of aging, health, and healthcare issues mainly from sociological and public health perspectives. Review and application of appropriate concepts, theories, and methods. **Same as** SOC 528.

Prerequisite(s): CHSC 425 or consent of instructor.

529 Gerontological Health/Illness Behavior 3 hours.

Perceptions and behaviors of older adults are examined in reference to illness prevention, health promotion, and reactions to acute and chronic illness. Priority enrollment is given to students in the Gerontology track of the Division of Community Health Sciences within the School of Public Health or consent of the instructor.

534 Management and Analysis of Qualitative Data 3 hours.

A hands-on course that teaches conceptual and technical skills for organizing and analyzing qualitative (textual) data from focus groups, in-depth interviews, and other sources, using specialized text-analysis computer software. Extensive computer use required.

Prerequisite(s): CHSC 434 or consent of the instructor.

542 Advanced Maternal and Child Health Applied Programs 3 hours.

Interventions and services in healthcare programs for maternal and child populations. In-depth program analysis and problem solving with emphasis on public sector programs, population needs and program evaluation. **Prerequisite(s):** CHSC 441.

543 MCH Policy and Advocacy 3 hours.

Explores the social, economic, and political dynamics which influence the development and implementation of MCH policy and U.S. health policy in general. **Prerequisite(s):** CHSC 441 or consent of the instructor.

544 Public Health Aspects of Adolescent Health 3 hours.

Students research contemporary issues in adolescent health, relating them to physical and emotional development, to policy and to the Year 2010 Objectives.

Prerequisite(s): Credit or concurrent registration in CHSC 441.

545 Reproductive and Perinatal Health 3 hours.

Focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. **Same as** EPID 545. **Prerequisite(s):** BSTT 400; and EPID 400 or EPID 403; or 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(s): CHSC 411 or CHSC 441 or consent of the instructor.

548 Readings in Reproductive and Perinatal Epidemiology 2 hours.

Advanced seminar in reproductive/perinatal epidemiology

with particular emphasis on methodologic issues. **Same as** EPID 548. **Prerequisite(s):** CHSC 441 and EPID 404 or consent of the instructor. **Recommended background:** Maternal and child health and epidemiology.

549 Advanced Applied Methods in MCH Epidemiology 3 hours.

Gives conceptual and technical understanding of statistical and epidemiological methods, builds skills/proficiency in applying these. Attention is given to data handling tasks and to statistical/epidemiologic strategies for analysis and presentation. **Same as** EPID 549.

Prerequisite(s): EPID 402 or EPID 404; and BSTT 401 and EPID 406; or consent of the instructor.

Recommended background: Credit or concurrent registration in EPID 501.

551 Foundations of Public Health Inquiry 3 hours.

Examination of research paradigms, precepts of theory development, literature synthesis, and ethical principles. All enhance the scholarlyness and meaningfulness of doctoral students' public health inquiry.

Prerequisite(s): Open only to PhD degree students.

554 International Women's Health: Current and Emerging Issues 3 hours.

Enhance students' understanding of, and sensitivity to, current and emerging international women's health issues. The focus will include studying social and cultural factors affecting women's physical as well as psychosocial health.

Prerequisite(s): CHSC 400; or consent of the instructor.

556 Theory and Methods of Needs Assessment in Aging and Disability 4 hours.

Introduces theories of need, models of the needs assessment process, and reviews research methods typically used in conducting needs assessments. Emphasis will be on needs assessments in health-related community agencies. **Same as** DIS 556 and OT 556.

Prerequisite(s): A 400- or 500-level research course such as OT 510, DHD 415, CHSC 446, or SOC 500. The prerequisite research course needs to provide students with an understanding of basic research design, sampling strategies, and an introduction to methods



such as surveys and focus groups.
Recommended background: Health or behavioral sciences, research methods.

**564
Community Integration in Developmental Disabilities** 3 hours.
Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings. **Same as** DHD 564 and DIS 564.

**577
Survey Questionnaire Design** 3 hours.
Concepts and strategies for developing survey questionnaires for various modes of survey data collection. Students develop and present questionnaires related to their individual interests. **Same as** PA 577.
Prerequisite(s): CHSC 446 or CHSC 447; or consent of the instructor.

**584
Community Organizing for Health** 3 hours.
Focus on the bases of facilitating community organizing processes in health promotion including theories, fieldwork tools, and feminist and international perspectives. Fieldwork required. **Prerequisite(s):** CHSC 480 or consent of the instructor.

**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 (according to federal guidelines) or equivalent final paper required. **Prerequisite(s):** CHSC 446 and CHSC 480.

**594
Advanced Special Topics in Community Health Sciences** 1 TO 4 hours.
Advanced study of topics in maternal and child health, gerontology, behavioral science of health and illness, international health, community health, and public health practice. May be repeated. Students may register in more than one section per term. Topics vary by semester. **Prerequisite(s):** BSIT 400 and CHSC 400 and EPID 400 or equivalent and consent of the instructor. **Recommended background:** Advanced placement in graduate program.

**595
Seminar in Community Health Sciences** 1 TO 3 hours.
Analysis of current theory and research in community health sciences. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. Topics vary by seminar. **Prerequisite(s):** Consent of the instructor.
Recommended background: Advanced placement in graduate program.

Computer Science (CS)
**401
Computer Algorithms I** 3 OR 4 hours.
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. **Same as** MCS 401. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 360 and grade of C or better in STAT 381; or grade of C or better in CS 202.

**411
Artificial Intelligence I** 3 OR 4 hours.
Problem representation; rule-based problem-solving methods; heuristic search techniques. Application to expert systems, theorem proving, language understanding. Individual projects. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 202.

**415
Computer Vision I** 3 OR 4 hours.
Computer vision system design. Segmentation and representation of regions and boundaries; image filtering; object recognition; advanced topics (examples: texture, stereo, color); applications. Programming assignments. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 202 or MCS 360; or consent of the instructor.

**421
Natural Language Processing** 3 OR 4 hours.
Design of natural language processing systems; part-of speech tagging, statistical and symbolic parsers; semantic interpretation; discourse and dialogue processing; natural language generation; applications. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 301 or MCS 441.

**422
User Interface Design and Programming** 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 340.

**426
Multimedia Computing** 3 OR 4 hours.
Processing multimedia information, including video, images, audio, text, and specialty data. Multimedia sources, formats, operations, and algorithms. Implementation projects. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 202 or MCS 360; or consent of the instructor.

**440
Software Engineering I** 3 OR 4 hours.
Software lifecycle model, requirement specification techniques, large-scale software design techniques and tools, implementation issues, testing and debugging techniques, software maintenance. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 340.

**441
Distributed Object Programming Using Middleware** 3 OR 4 hours.
Design and implementation of distributed object programs using middleware software standards; interface definition languages and programming language mappings; static and dynamic object communication mechanisms. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** CS 340 and CS 385.

**442
Software Engineering II** 3 OR 4 hours.
Advanced concepts in software development: requirements engineering, cost estimation, risk analysis, extreme programming, regression test case selection, and design patterns. Software lab assignments required. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** CS 440.

**450
Introduction to Networking** 3 OR 4 hours.
Network protocols, algorithms, and software issues. Topics include the Open Systems Interconnect model, data link, network and transport layers, TCP/IP, ATM, mobile networks. 3 undergraduate hours. 4

graduate hours. Credit is not given for CS 450 if the student has credit for ECE 433. **Prerequisite(s):** CS 202 and CS 385; and STAT 381 or STAT 401 or IE 342.

**455
Design and Implementation of Network Protocols** 3 OR 4 hours.
Network protocols and their software. Examines OS network interface through network layers. Topics include routing, congestion control, fault tolerance, security, name servers, multicast, and performance. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 340 and CS 450.

**466
Advanced Computer Architecture** 3 OR 4 hours.
Design of high performance computer architecture. Cost-Performance; Instruction Sets; Pipelining; Memory Hierarchy; I/O. 3 undergraduate hours. 4 graduate hours. Credit is not given for CS 466 if the student has credit for ECE 466. **Prerequisite(s):** CS 366.

**469
Computer Systems Design** 3 OR 4 hours.
Analysis and modeling of digital systems; hardware description languages; CAD tools for simulation, synthesis, and verification of computer systems. Project: a simple processor design. 3 undergraduate hours. 4 graduate hours. Credit is not given for CS 469 if the student has credit in either ECE 368 or ECE 469. **Prerequisite(s):** CS 366.

**473
Compiler Design** 3 OR 4 hours.
Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. **Same as** MCS 411. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in CS 301 or grade of C or better in MCS 441; and grade of C or better in CS 202 or grade of C or better in MCS 360; and grade of C or better in CS 266.

**474
Object-Oriented Languages and Environments** 3 OR 4 hours.
Data abstraction, classes and objects, messages and methods, polymorphism and dynamic binding, inheritance. Object-oriented design. Pure and hybrid object-oriented languages. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 340.



475 Object-Oriented Programming 3 OR 4 hours.
OO Paradigm: classes, messages, methods, variables, inheritance, polymorphism; the C++ and Java languages; programming labs required. 3 undergraduate hours. 4 graduate hours. Credit is not given for CS 475 if the student has credit for CS 340 or CS 474. Extensive computer use required.
Prerequisite(s): CS 202; and consent of the instructor.

476 Programming Language Design 3 OR 4 hours.
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. **Same as** MCS 415. 3 undergraduate hours. 4 graduate hours. Previously listed as EECS 476. **Prerequisite(s):** MCS 360 or CS 340.

480 Database Systems 3 OR 4 hours.
Database design, logical design, physical design. Relational databases. Recovery concurrency control. Normalization. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): CS 202.

485 Networked Operating Systems Programming 4 OR 5 hours.
Concepts, design, and programming of multiprocess and distributed systems; interprocess communications; fault tolerance; distributed programming semantics. Programming assignments and project required. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** CS 385.

488 Computer Graphics I 0 TO 4 hours.
Principles of interactive computer graphics. Raster and vector display techniques, and hardware considerations. Introduction to two-dimensional and three-dimensional rendering. Laboratory **Same as** AD 488. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Credit or concurrent registration in CS 340.

491 Seminar 1 TO 4 hours.
Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the *Schedule of Classes*. May be repeated.
Prerequisite(s): Consent of the instructor.

493 Special Problems 2 TO 4 hours.
Special problems or reading by special arrangement with the faculty. No graduate credit for Computer Science majors. **Prerequisite(s):** Consent of the instructor.

501 Computer Algorithms II 4 hours.
Continuation of MCS 401 (Same as CS 401). Advanced topics in algorithms. Lower bounds. Union-find problems. Fast Fourier transform. Complexity of arithmetic, polynomial, and matrix calculations. Approximation algorithms. Parallel algorithms. **Same as** MCS 501.
Prerequisite(s): MCS 401 or CS 401.

502 Design and Analysis of Efficient Algorithms in Computational Molecular Biology 4 hours.
Design and analysis of efficient algorithms for computational problems in molecular biology such as genome sequencing and construction of evolutionary trees.
Prerequisite(s): Grade of B or better in CS 401; or consent of the instructor. **Recommended background:** CS 501 and some exposure to basic chemistry and biology.

503 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(s): Consent of the instructor.

505 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(s):** CS 301.

511 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(s): CS 411.

514 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(s): CS 411.

515 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.
Prerequisite(s): CS 415.

521 Statistical Natural Language Processing 4 hours.
Statistical techniques for Natural Language Processing, including maximum likelihood estimation, Hidden Markov Models, and probabilistic grammars; and their applications, including parsing, semantic inference, dialogue processing, and summarization. **Prerequisite(s):** CS 421; or consent of the instructor.

522 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.
Prerequisite(s): CS 422.

523 Multimedia Systems 4 hours.
Principles of multimedia interface design for computer applications. Multidisciplinary approaches to integrating text, still images, animation, and sound into human-computer interfaces. **Prerequisite(s):** CS 422; or consent of the instructor.

526 Computer Graphics II 4 hours.
State of the art in computer graphics and interactive techniques: three-dimensional surface and volumetric models. A laboratory is required. **Same as** AD 588.
Prerequisite(s): CS 488.

527 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(s): CS 488.

528 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(s): CS 488.

540 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(s): CS 440; or consent of the instructor.

541 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(s): CS 540; or consent of the instructor.

542 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(s): CS 440.

545 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(s): Consent of the instructor.

553 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.
Prerequisite(s): CS 366 and CS 385.

554 Advanced Topics in Concurrent Computing Systems 4 hours.
Petri nets, methods and their applications to concurrent, distributed,



parallel, and data-flow systems; and logic programming and rule-based systems. **Prerequisite(s):** Consent of the instructor.

559 Neural Networks 4 hours. Artificial neural networks, perceptron, backpropagation, Kohonen nets, statistical methods, Hopfield nets, associative memories, large memory networks, cognition. **Same as ECE 559. Prerequisite(s):** 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(s):** Consent of the instructor.

565 Algorithms for VLSI Physical Design 4 hours. Computer-aided physical design of integrated circuits; circuit partitioning and placement; floorplanning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation. Credit is not given for CS 565 if the student has credit for ECE 565. **Prerequisite(s):** CS 401 and CS 469; or consent of the instructor.

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(s):** CS 466.

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(s):** CS 466.

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(s):** CS 385 and CS 480; and knowledge of C++, or consent of the instructor.

580 Query Processing in Database Systems 4 hours. Query processing in deductive databases and in distributed/parallel databases systems. **Same as IDS 511. Prerequisite(s):** CS 480.

581 Database Management Systems 4 hours. Concurrency control; reliability, recovery data integrity, database machines, and current topics. **Prerequisite(s):** CS 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(s):** CS 480.

583 Data Mining and Text Mining 4 hours. Provide students with a sound knowledge in data and text mining tasks and techniques as well as ensure students' ability to use this technology. **Prerequisite(s):** CS 401. **Recommended background:** Algorithm probability.

586 Data and Web Semantics 4 hours. Data modeling and semantics; knowledge representation, querying, and reasoning for the semantic Web; metadata; data integration and interoperability; Web services; applications. Extensive computer use required. **Prerequisite(s):** CS 480 or equivalent.

587 Computer Systems Security 4 hours. Security policies; security properties; protection mechanisms for single systems, networked systems, and distributed computing; trust; attacks on computer systems. Extensive computer use required. **Prerequisite(s):** CS 485 or CS 450; or consent of the instructor.

594 Special Topics 4 hours. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595 Departmental Seminar 0 hours. Seminar by faculty and invited speakers. Satisfactory/Unsatisfactory grading only. May be repeated.

596 Individual Study 1 TO 4 hours. Individual study or research under close supervision of a faculty member. May be repeated. Students may register in more than one section per term. No graduation credit for students in the following: MS in Computer Science or PhD in Computer Science. **Prerequisite(s):** Consent of the instructor. For Computer Science majors only.

597 Project Research 0 TO 9 hours. A research design or reading project approved by the committee appointed by the director of graduate studies. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor. For CS majors only.

598 MS Thesis Research 0 TO 16 hours. MS thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor. For CS majors only.

599 PhD Thesis Research 0 TO 16 hours. PhD thesis work under supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor. For CS students only.

Criminal Justice (CRJ)

402 Trial Interaction 3 OR 4 hours. Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. **Same as LING 402.** 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 261 and CRJ 350; or consent of the instructor.

404 Roman Law and the Civil Law Tradition 3 OR 4 hours. Roman law and its relationship to values and social structure; social

analysis through law; continental law tradition. **Same as CL 404 and HIST 404.** 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 200 or CL 203 or HIST 203 or consent of the instructor.

405 The Problem of Justice 3 OR 4 hours. Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. **Same as POLS 405.** 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101, plus two 200-level courses in criminal justice or two 200-level courses in political science.

421 Juvenile Justice System 3 OR 4 hours. Theories of juvenile delinquency and rule-breaking; juvenile rights; organization and administration of the juvenile justice system in the U.S. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 210 and CRJ 220.

422 Victimization 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101 and two 200-level criminal justice courses.

423 Violence 3 OR 4 hours. 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. **Same as ANTH 424.** 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101 and CRJ 200.

424 Gender, Crime, and Justice 3 OR 4 hours. 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. **Same as GWS 424.** 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101 and CRJ 220; or consent of the instructor.

435 Organized and White Collar Crime in the United States 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Two 200-level criminal justice courses.

442 Comparative Criminal Justice Institutions 3 OR 4 hours. Comparative study of law, jurisprudence, enforcement, and punishment in Western and non-Western societies, including civil law, common law, and Islamic systems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Two 200-level criminal justice courses.

456 Community Corrections 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 350 or CRJ 355; plus one 200-level criminal justice course.

480 Application of Science to the Law 4 hours. 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. **Same as BPS 480.** **Prerequisite(s):** CRJ 210 and CRJ 260; or graduate standing.

491 Topics in Rule Breaking 3 OR 4 hours. Content of course varies, addressing major issues. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Students may register in more than one section per term. **Prerequisite(s):** Six 200- or 300-level criminal justice courses.

492 Topics in Rule Application 3 OR 4 hours. Content of course varies, addressing major issues. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Students may register in more than one section per term. **Prerequisite(s):** 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.

and the promotion of social and economic enterprises.

520 Criminological Theory 4 hours. Critical examination of the major traditions in criminological theories; emphasis on critical, positivist, interpretivist, and postmodern.

539 Seminar in Rule Breaking 4 hours. 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. May be repeated to a maximum of 8 hours. **Prerequisite(s):** 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.

547 Race, Class, and Gender Dimensions of Crime and Justice 4 hours. Theories addressing the intersections of race, class, gender, crime, and justice. Specifically students examine criminological theories; social construction of race, class, and gender; legal decision-making and implications of this for justice in our society. **Same as GWS 547.**

548 Legal Discourse and Culture in Law and Society 4 hours. Discourse, power, and culture in legal settings and analysis of power and resistance in the construction of law as a social fact. **Prerequisite(s):** CRJ 500.

555 Corrections: Institutions and Field Operations 4 hours. Examines institutions and field services in public and private sectors. Addresses historical and empirical approaches to the analysis of policy

and correctional effectiveness; the neoclassical challenge to rehabilitation, and corrections case law. **Prerequisite(s):** CRJ 540.

560 Quantitative Methods and Design 4 hours. Fundamentals of scientific inquiry, the logic of causal inference, and quantitative methods. Development of critical perspective and identification of weaknesses in research design and measurement. Development of skills in proposal development and data collection unique to criminal justice. **Prerequisite(s):** 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(s):** CRJ 262 or consent of the instructor.

562 Statistical Applications in Criminal Justice I 4 hours. Basic descriptive and inferential statistics, their applications in data analysis, and assumptions underlying use of these procedures in criminal justice research. **Prerequisite(s):** CRJ 262 or the equivalent.

563 Evaluation Research in Criminal Justice 4 hours. Experimental, quasi-experimental, and nonexperimental approaches to evaluation research; indicators of effectiveness. Applications to crime prevention, police, courts, and correctional programs. Politics of researcher-agency interactions. **Prerequisite(s):** One graduate-level course in research methods and consent of the instructor.

564 Statistical Applications in Criminal Justice II 4 hours. Introduction to multivariate statistics with emphasis on multiple regression in criminal justice research, analysis, and interpretation of regression output, coding of variables, and path analysis. **Prerequisite(s):** CRJ 562.

570 Advanced Methods in Criminal Justice 4 hours. Methodological problems in criminal justice measurement including the identification problem in estimating deterrence and the limitations of survival analysis in estimating recidi-

vism. Students are required to submit a paper demonstrating evidence of independent research skills. **Prerequisite(s):** CRJ 560 and CRJ 561 or the equivalent.

580 Forensic Science: Survey and Foundations 2 hours. Survey course for forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, and pattern evidence. **Same as BPS 580.** **Prerequisite(s):** Approval of the department.

589 Special Topics in Forensic Science 3 hours. Content may vary but will revolve around the philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to noncriminalistics fields. **Same as BPS 589.** May be repeated if topics vary. **Prerequisite(s):** Consent of the instructor.

592 Internship in Criminal Justice 2 TO 4 hours. Placement in a criminal justice agency or setting under the supervision of a faculty member with an accepted research project and paper. May be repeated to a maximum of 4 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

594 Selected Issues in Crime and Criminal Justice 4 hours. Current issues and advanced problem areas related to deviance, crime, etiology labeling, criminal careers, organized crime, and victimology. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

596 Independent Study or Research 2 TO 8 hours. 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. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of instructor and approval of the director of graduate studies.





597
Research 0 TO 8 hours.
Independent research project under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Graduate standing in the MA in Criminal Justice program and consent of the instructor.

598
Thesis
Research 0 TO 16 hours.
For students doing thesis research or writing. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. **Prerequisite(s):** 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.
Research on the topic of the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 20 hours. **Prerequisite(s):** Consent of faculty adviser and director of graduate studies.

Curriculum, Instruction, and Evaluation (CIE)

410
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.

411
Creating Learning Environments in the Elementary School 3 hours.
Examination of beliefs about teaching culture and learning in urban America in relation to the creation of learning environments with emphasis on application of state standards in classrooms and the development of an electronic teaching portfolio. 30 hours of fieldwork required. **Prerequisite(s):** Open only to master's degree students.

412
Dynamics of Learning Environments 3 hours.
Exploration of multiculturalism and bilingualism/biculturalism in schools and families. Continued development of electronic portfolio for meeting Illinois professional teaching and technology standards. **Prerequisite(s):** Graduate standing and satisfactory comple-

tion of fieldwork and grade of B or better in CIE 411.

413
Foundations of Literacy Instruction, K-8 4 hours.
Introduction to teaching literacy K-8; examining cognitive, social, developmental perspectives; relationships between language and literacy; connections to other school subjects; aligning instruction, assessment, standards. Extensive computer use required [word processing on writing; search engines for examining literacy curriculum, professional organizations, e-mail networks]. **Prerequisite(s):** CIE 450; and consent of the instructor. Open to Master's degree students and PhD degree students. **Recommended background:** Admission to MEd in Instructional Leadership: Literacy, Language, and Culture.

414
Middle and High School Literacy 3 hours.
Focuses on the teaching of reading and writing strategies appropriate for disciplinary learning and expression. Fieldwork required. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

415
Urban Youth Fieldwork 3 hours.
Experience in planning, teaching in, and evaluating innovative physical activity-based urban youth programs. Accompanying seminar to examine related literature and explore the interface between theory and practice. May be repeated to a maximum of 6 hours. Fieldwork required. **Prerequisite(s):** Junior standing or above; and consent of the instructor. Requires interview and placement.

416
Programs for Underserved Youth 3 hours.
Survey and evaluation of physical activity-based and other models and programs designed to help underserved youth in school, extended day, and special programs. Includes development of new models. **Prerequisite(s):** Junior standing or above and consent of the instructor.

450
Literacy and Society 4 hours.
Explores the significant role of literacy in cognition, law, economics, social and personal life, and its implications for teaching and learning. Extensive computer use required. **Prerequisite(s):** Graduate standing.

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 in bilingual/ESL settings. **Prerequisite(s):** Junior standing and admission into the College of Education or consent of instructor.

472
Language Proficiency Assessment and ESL Instruction 4 hours.
English language proficiency assessment instruments and procedures; effective planning and ESL instructional practices; methods, materials, and technology resources for teaching ESL in K-12 school settings. **Prerequisite(s):** Junior standing or above.

480
Technology and Multimedia: Learning Tools in the Classroom 3 OR 4 hours.
New technologies to support teaching and learning in precollege classrooms. **Same as** SPED 480. 3 undergraduate hours. 4 graduate hours.

481
Foundations and Current Issues in Educating English Language Learners 4 hours.
Philosophical, theoretical, socio-cultural, and educational examination of learning and achievement issues that culturally and linguistically diverse students face in American schools. Fieldwork required. **Prerequisite(s):** Junior standing or above.

482
Assessment and Instruction: A Multilingual/Multicultural Perspective 4 hours.
Methods and materials for teaching English language learners (ELLs) in bilingual/ESL classrooms. Emphasis upon curricular and methodological practices, assessment for academic placement, and instruction. **Prerequisite(s):** Junior standing or above. **Recommended background:** CIE 481.

483
Methodology of TESOL 3 OR 4 hours.
Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. **Same as** LING 483. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Junior standing and 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. **Prerequisite(s):** ED 200 and ED 210; or graduate standing and either ED 402 or ED 403, and either ED 421 or ED 422 or ED 445 and either ED 430 or ED 431 and approval of the College of Education.

494
Special Topics in Curriculum, Instruction, and Evaluation 1 TO 4 hours.
Exploration of an area not covered in existing course offerings. Content varies. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

500
Proseminar in Curriculum and Instruction 1 hour.
Research-oriented colloquia on issues in curriculum and instruction. Serves as introduction to faculty research interests. Provides opportunity to consider issues in research design. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Admission to the PhD in Education program or consent of instructor.

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. **Prerequisite(s):** ED 402 or ED 403; and either ED 421 or ED 422 or ED 445; and ED 430; and CIE 460; and a second reading methods course.

503
Advanced Foundations of Literacy Instruction, K-8 4 hours.
Introduction to teaching literacy K-8; examining cognitive, social, developmental perspectives; relationships between language and literacy; connections to other school subjects; aligning instruction, assessment, and standards. Extensive computer use required [word processing on writing; search engines for examining literacy curriculum, professional organizations, e-mail networks].

Prerequisite(s): CIE 450; or consent of the instructor. Open to Master's degree students and PhD degree students. **Recommended background:** Admission to MEd in Instructional Leadership: Literacy, Language, and Culture.

504 Secondary Literacy 4 hours. This course focuses on the foundations of literacy and on the literacy processes of middle and secondary students and how these processes apply to reading and writing in the disciplines. Fieldwork required.

505 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(s):** CIE 460; or consent of the instructor.

507 Teaching and Learning Mathematics in the Elementary School 4 hours. Integrating mathematics content with teaching and learning issues, including adapting and developing curriculum, planning, classroom interactions, and assessment in K-9 classrooms. **Prerequisite(s):** CIE 411 and CIE 412.

508 Teaching and Learning Science in Elementary School 4 hours. To help prospective teachers develop multiple frameworks for facilitating the learning of science in students of various abilities, cultures, and backgrounds. **Prerequisite(s):** CIE 411 and CIE 412.

509 Reading and Writing with Young Children 4 hours. The early writing and reading behaviors of children and how these develop during the primary grades. Observation, teaching, and assessing are emphasized. **Prerequisite(s):** ED 422; and consent of the instructor.

511 Student Teaching in the Elementary Grades I 6 hours. Culminating course in graduate elementary teacher education. Meets Illinois State Board of Education requirements for certification. **Prerequisite(s):** Completion of all professional education courses and program requirements. Must enroll concurrently in CIE 512.

512 Student Teaching in the Elementary Grades II 6 hours. The culminating course in the graduate elementary teacher education sequence. Meets Illinois State Board of Education requirements for certification.

Prerequisite(s): CIE 501 and CIE 502. Must enroll concurrently in CIE 511.

515 Urban Youth Program Evaluation 3 hours. Analysis of the impact of social trends and problems on urban youth. Evaluation of urban youth programs with emphasis on affective and moral dimensions.

517 Seminar in Urban Youth Development 3 hours. In-depth analysis of topics and issues in the field of youth development, with special attention to the urban context and the role of physical activity. **Prerequisite(s):** Consent of the instructor.

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(s):** 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(s):** 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(s):** Graduate standing in the College of Education or consent of the instructor.

525 Assessment and Instruction for Struggling Readers, K-12: Part 1 4 hours. Theoretical and practical issues concerning the etiology of reading problems and clinical diagnostic

techniques. Children with reading problems are diagnosed and taught in the practicum component. **Prerequisite(s):** CIE 450; and CIE 503 or CIE 504; and consent of the instructor.

526 Assessment and Instruction for Struggling Readers, K-12: Part 2 4 hours. Continued study of theoretical and practical issues concerning the etiology of literacy problems and clinical diagnostic and instructional techniques. Practicum involves tutoring clients in the UIC Reading Clinic. **Prerequisite(s):** CIE 525.

527 Reading Specialists As Literacy Leaders 4 hours. Theories and practices related to the role of the reading specialist, including management and evaluation of support systems, programs, personnel, and professional development in literacy. **Prerequisite(s):** CIE 450 and CIE 503 and CIE 504.

528 Assessing Literacy in Classrooms 4 hours. Introduction to K-12 classroom literacy assessment, focus on relations among assessment, teaching and learning; tools and procedures, data analysis and interpretation, reporting and record keeping. Extensive computer use required [word processing on writing; search engines for examining literacy curriculum, professional organizations, e-mail networks, use of Powerpoint, Excel, and SPSS]. **Prerequisite(s):** CIE 450 and CIE 503 and CIE 504 and consent of the instructor. Open only to Master's degree students. **Recommended background:** Admission to MEd in Instructional Leadership: Literacy, Language, and Culture.

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. **Prerequisite(s):** ED 430 or CIE 574 or ED 431 or ED 543; and consent of the instructor.

535 Studies in Literacy Research and Teacher Inquiry 4 hours. Analysis of methodologies and topics of reading research; decision-making processes for effective literacy instruction based on research; skills and strategies in designing teacher inquiry. Extensive

computer use required (word processing on writing; search engines for identifying research studies, including teacher researcher Web sites). **Prerequisite(s):** CIE 450 or CIE 503 or CIE 504; and consent of the instructor. Requires admission to the MEd in Instructional Leadership: Language, Literacy, and Culture program or consent of the instructor.

536 Colloquium on Literacy 1 hour. Various areas of reading, writing, and literacy, including research on learning, instruction, and use. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Enrollment in a graduate specialization in reading, and consent of the instructor.

539 Internship in Instructional Leadership 4 hours. 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). May be repeated to a maximum of 8 hours. **Prerequisite(s):** 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.

541 Oral Language: Its Development and Role in the Classroom 4 hours. Analysis of oral language development and children's varying patterns of language use; analysis of talk in classroom settings and instructional decision-making processes to assess and optimize student learning. Extensive computer use required. Fieldwork required. **Prerequisite(s):** CIE 450 and either CIE 503 or CIE 504. Restricted to graduate students in education, psychology or English.

542 Improving School/District Literacy Achievement 4 hours. Review of research on school/factors implicated in improvement of literacy achievement. Role of empirical evidence (best practices, scientifically based research, research synthesis, best odds studies) in



school decision making and policy.
Prerequisite(s): CIE 450 and CIE 503 and CIE 504.

**543
Using Multimedia
Environments to
Support Literacy
and Learning 4 hours.**

Introduction to ways changes in technologies of communication transform environments for teaching and learning. Analyzing technologies, linear and nonlinear reading environments, and designing instructional strategies to enhance multiple literacies. Extensive computer use required.

Prerequisite(s): One social science course or one computing course focused on the human use of computing.

**544
Foundations of
Writing 4 hours.**

Introduction to K–8 writing research, theory and practice, including writing development, processes, text pedagogy, assessment. Combination of academic study of writing with guided inquiry. Computer use required (word processing on writing; search engines for examining literacy curriculum, professional organizations, e-mail networks, use of PowerPoint and Web page composers). **Prerequisite(s):** CIE 450. **Recommended background:** Admission to the MEd in Instructional Leadership: Literacy, Language, and Culture.

**545
Educational
Evaluation 4 hours.**

Examination of theoretical and operational assumptions of alternative evaluation models; analysis and critique of evaluation case studies.

Prerequisite(s): Admission to PhD in Education program or PhD in Public Policy Analysis program.

**546
Children's and
Adolescent
Literature 4 hours.**

Overview of trade books written for children from preschool through adolescence. Emphasizes critically reading, selecting, evaluating books appropriate for developmental stages, curricular connections, and students in our multicultural society.

Prerequisite(s): CIE 450 and CIE 503 and CIE 504; and consent of the instructor.

**547
Integrating Literacy
Instruction 4 hours.**

Engaging in professional experiences (e.g., teacher inquiry, teacher book clubs) that support the design and adaptation of frameworks and

units that emphasize meaningful instructional connections among reading, writing, and talk in the classroom. Extensive computer use required. **Prerequisite(s):** CIE 450 and either CIE 503 or CIE 504. Restricted to graduate students in Education, Psychology or English.

**548
Leadership for
Literacy Instruction 4 hours.**

School and system leadership practices for promoting effective literacy instruction in urban elementary and secondary schools. Assessment and improvement of literacy curriculum, pedagogy, and evaluation. **Same as PS 548. Prerequisite(s):** Consent of the instructor; admission to a degree program in the College of Education. Students admitted to the EdD in Urban Education Leadership, prerequisites also include PS 550 and PS 552.

**549
Teaching for Social Justice
in K–12 Schools: Theory
and Practice 4 hours.**

Examine theory and practice of social justice teaching in schools, including history, liberatory pedagogies, culturally relevant and critical pedagogies, funds of knowledge, critical multiculturalism and antiracist pedagogy, critical race theory. **Same as PS 549.**

Prerequisite(s): Consent of the instructor.

**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(s):** Admission to a graduate program in education.

**551
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(s):** CIE 574 or consent of 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(s): CIE 574 or consent of the instructor.

**556
Proseminar in Literacy,
Language, and
Culture I 4 hours.**

Socialization of students into field through intensive introduction to literacy, its relationship to language and culture, using the collective knowledge and research experience of faculty. Emphasis on developing student inquiry in urban contexts. Restricted to first-year doctoral students with a specialization in Literacy, Language, and Culture.

**557
Proseminar in Literacy,
Language, and
Culture II 4 hours.**

Socialization of students into field through intensive introduction to literacy, its relationship to language and culture, using the collective knowledge and research experience of faculty. Emphasis on developing student inquiry in urban contexts. Restricted to first-year doctoral students with a specialization in Literacy, Language, and Culture.

**558
The Historical and
Philosophical Bases of
Literacy and Literacy
Instruction 4 hours.**

Critical examination of historical and philosophical bases of current literacy and literacy instruction from social, cultural, and psychological perspectives. Emphasis on historical patterns of reading and writing instruction in the U.S. **Prerequisite(s):** Consent of the instructor.

**559
The Social and Cultural
Contexts of Literacy
and Literacy
Instruction 4 hours.**

Critical examination of theoretical and methodological orientations that inform the study of sociocultural influences on the definition and practices of literacy in classrooms, at school level, and in out-of-school contexts. **Prerequisite(s):** Consent of the instructor.

**561
Genre Theory and
Practice 4 hours.**

Analysis of perspectives and methodologies employed in genre theory and practice; exploration and evaluation of discourse-analysis approaches used in genre research; critical examination of sociocultural bases of genre. **Prerequisite(s):** Consent of the instructor.

**562
Design and
Conduct of
Literacy Research 4 hours.**

Design principles for the study of literacy development and education.

Emphasis is on examining lines of literacy research from multiple design perspectives; relationship between research design and theory and epistemology. Fieldwork required. Computer use required.

Prerequisite(s): Consent of the instructor.

**563
Analysis of
Research in
Literacy 4 hours.**

Critical analyses of literacy-related research methods, their implications for interpreting research, the forms in which research is published, manuscript review process, and ethical considerations that inform all of the above. **Prerequisite(s):** CIE 581 or CIE 586; and consent of the instructor.

**564
Design and Conduct of
Literacy Research 4 hours.**

Introduction to design principles informing the study of literacy development and education. Emphasis on conducting literacy research from multiple design perspectives and the relationship between epistemology, theory and research design.

Prerequisite(s): ED 502 and ED 503 and CIE 563. Priority in enrollment will be given to students admitted into Literacy, Language, and Culture doctoral program.

**568
Research in Children's
and Adolescent
Literature 4 hours.**

Topical seminar that examines research on a specific area of children's or adolescent literature, such as multicultural literature, picture books, nonfiction texts, or the development of literacy understanding in children/adolescents. May be repeated to a maximum of 8 hours.

Prerequisite(s): Consent of the instructor and an undergraduate or master's level survey course on children's/adolescent literature.

**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(s): 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 integrat-



tion of mathematics, science, and English as a Second Language development. **Prerequisite(s):** 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(s): 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(s):** ED 430 or admission to the PhD in Education program or the PhD in Public Policy Analysis program.

**575
Seminar in Research Issues with English Language Learners 4 hours.**

Selected topics on research in the education of language minority students for advanced MEd and PhD students. Topics vary each semester. May be repeated to a maximum of 12 hours. **Prerequisite(s):** 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(s):** CIE 574 or consent of the instructor.

**577
Literacy In and Out of School 4 hours.**

Analysis of literacy practices in formal and informal contexts. Focus on community and family contributions to literacy learning; emphasis on consequences of cultural congruity and discontinuity between in- and out-of-school literacy practices.

Prerequisite(s): 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(s): ED 502.

**579
Biliteracy: Theory, Research, and Practice 4 hours.**

Theoretical foundations, research paradigms, and issues focusing on bilingual and biliteracy practices in and between home, school, and community contexts.

Prerequisite(s): Consent of the instructor.

**581
Perspectives on Reading: Theory, Research, and Practice 4 hours.**

Introduction of doctoral students to perspectives underlying theory, research, and practices related to understanding reading and reading instruction. Study of how research and practice are framed, shaped, and constrained by theoretical perspectives. **Prerequisite(s):** Priority will be given to students admitted into the Literacy, Language, and Culture doctoral program.

**582
Research Perspectives on Literacy in the Disciplines 4 hours.**

Literacy is an integral part of expertise in the major fields of study. This course reviews the research in literacy and its related constructs in the disciplines of mathematics, science, history and English.

Prerequisite(s): Consent of the instructor.

**583
Early Literacy: Theory, Research, and Practice 4 hours.**

Analysis of theories and research focusing on the initial phases of young children's acquisition of reading and writing, with emphasis on issues related to instruction.

Prerequisite(s): CIE 503 and consent of the instructor.

**584
Semiotics, Literacy, and Learning 4 hours.**

Theory and research focusing on language and literacy as they relate to other embodied forms of meaning making; how these varied meanings are socially and culturally mediated; the ways in which they enable and constrain processes of learning.

Prerequisite(s): Consent of the instructor.

**585
Seminar in Literacy Studies 4 hours.**

Selected topics in literacy theory, research, and practice for advanced PhD students. Topics vary each semester. May be repeated to a maximum of 12 hours.

Prerequisite(s): CIE 563 or the equivalent or consent of instructor.

**586
Perspectives on Writing Instruction: Theory, Research, and Practice 4 hours.**

An examination of research and theoretical perspectives on writing and multimodal text construction, including critical reflection on perspectives that have contributed to changes in the ways we view texts, writing, writers, and instruction.

Prerequisite(s): CIE 544; and consent of the instructor. Priority in enrollment will be given to students admitted into Literacy, Language, and Culture doctoral program.

**587
Literacy Assessment: Theory, Research, and Practice 4 hours.**

Theory and practice in literacy assessment. Measurement issues unique to literacy assessment, including word recognition, vocabulary, comprehension, and writing. Critical consideration of how assessment both enables and constrains instruction. **Prerequisite(s):** CIE 503 and consent of the instructor.

**588
Design Research in the Study of Literacy 4 hours.**

Emphasis on understanding the conceptual frameworks that inform design research, integrating literacy theory into the design of teaching and learning environments; the use of design research in the study of literacy in various instructional settings. Individual and group participation, including participation on course listserv.

Prerequisite(s): Consent of the instructor.

**589
Literacy and Learning Technologies: Theory, Research, and Practice 4 hours.**

Critical analyses of how technologically based, multimedia transform instruction, with a focus on the design of strategies to enhance written, visual, and oral literacies using linear and non linear software and online environments.

Prerequisite(s): Consent of the instructor.

**590
Alternative Paradigms of Qualitative Research in Education 4 hours.**

Methodology, cases, and rationale for action research, educational criticism, critical ethnography, historiography, and phenomenological hermeneutics as alternatives in qualitative research in education.

Prerequisite(s): CIE 578 or con-

sent of instructor; and admission to PhD in Education program or PhD in Public Policy Analysis program.

**592
Apprenticeship in Teacher Education 1 TO 4 hours.**

Faculty guidance and supervision of doctoral students' teaching experience related to curriculum and instruction. Variable credit (1-4 hrs) given based upon scope of students' teaching responsibilities and proposed reflection on them.

Prerequisite(s): Consent of the instructor and program coordinator.

**593
PhD Research Project 1 TO 8 hours.**

Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Admission to the PhD in Education program.

**594
Special Topics in Curriculum, Instruction, and Evaluation 2 TO 4 hours.**

Seminar on a preannounced topic focusing on methodology, research, and educational implications of recent models of learning, problem solving, and thinking. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of instructor.

**596
Independent Study 1 TO 4 hours.**

Students design, implement, and analyze the results of a research problem in this area of specialization. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of study adviser.

**599
Thesis Research 0 TO 16 hours.**

Research on the topic of the student's dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the dissertation adviser.





Disability and Human Development (DHD)

401

Foundations of Disability and

Human Development 3 hours.

A critical review of key concepts and issues in disability. Students will develop a framework for understanding disability as a multilevel entity, including the impact of disability at personal, social, and societal levels. **Prerequisite(s):** Enrollment in the MS in Disability and Human Development program or consent of the instructor.

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(s):** DHD 401 or consent of the instructor.

440

Introduction to Assistive Technology: Principles and

Practice 3 hours.

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.

Prerequisite(s): Graduate standing or consent of the instructor.

Recommended background:

Undergraduates enrolled in health sciences, education, or engineering and working professionals seeking to develop assistive technology as an area of concentration.

441

Adaptive Equipment Design and

Fabrication 3 hours.

Examination of the interaction between design and disability, through comparison of appropriate design theories, materials, and work on consumer-based issues.

Prerequisite(s): Graduate standing; or DHD 440 and consent of the instructor. **Recommended background:** Undergraduates

enrolled in health sciences, education, or engineering, or working professionals seeking to develop assistive technology as an area of concentration.

444

Assistive Technology for Literacy, Learning, and Participation in Pre-K through

High School 3 hours.

Use of communication systems, computers, adapted equipment, and strategies to foster participation and inclusion of students in grades pre-school through high school. **Same as** SPED 444.

445

Topics in Disability Studies 3 OR 4 hours.

This course will focus on topics structured around particular aspects of disability studies and its practical, cultural, and theoretical implications. **Same as** ENGL 445. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): ENGL 361 or ENGL 362 or ENGL 363 or ENGL 364; and senior standing or above; or consent of the instructor.

460

Fundamentals of Behavior Analysis 3 hours.

Introduction to the principles, concepts, and applications of behavioral principles. Content includes philosophical origins, historic and current practices of experimental and applied behavior analysis.

Prerequisite(s): Credit or concurrent registration in DHD 401 or the equivalent.

464

Survey of Developmental Disabilities 3 hours.

Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research. **Same as** CHSC 464.

Prerequisite(s): Graduate standing or consent of the instructor.

494

Special Topics in Disability and Human Development 1 TO 4 hours.

Systematic study of selected topics in disability and human development. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Graduate standing or consent of the instructor.

510

Concepts in Interdisciplinary Research on Disability 3 hours.

Core concepts and methodologies of the major research traditions used in disability research. **Same as** DIS 510.

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.

Examination of parametric and nonparametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. **Same as** DIS 515. **Prerequisite(s):** An introductory course in statistics.

517

Ethics and Disability: Contemporary Problems 3 hours.

Ethical theories and ethical decision making are examined from an interdisciplinary disability studies perspective in relation to people with disabilities. Topics include assisted suicide, deinstitutionalization, and genetic discrimination. **Same as** DIS 517. **Prerequisite(s):** DHD 514 or consent of the instructor.

520

Disability and Physical Activity 3 hours.

Examination of the foundations of physical activity for persons with disabilities. Emphasis on strategies for promoting physical activity among persons with disabilities in community settings. **Same as** MVSC 520.

525

Technology to Promote Physical Activity Among Persons with Disabilities 3 hours.

Applications of new and emerging technologies to promote participation in and adherence to healthful physical activity by people with disabilities. Considers ways of redesigning physical, social, and attitudinal environments to achieve these outcomes. **Recommended background:** DHD 515 or an equivalent course on interpreting research findings.

526

Family Perspectives on Disability 3 hours.

Examines trends, theories and research methods, policies, and family-centered intervention approaches for families of persons with disabilities. **Same as** DIS 526. **Prerequisite(s):** Consent of the instructor.

532

Community Intervention 3 hours.

Theory, research, and practice of community interventions in public, nonprofit, and voluntary settings, such as disability organizations; intervention types and effectiveness; role of community intervenor. **Same as** PSCH 532. **Prerequisite(s):** Consent of the instructor.

535

Advocacy and Empowerment in Disability 3 hours.

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. **Same as** DIS 535.

537

Disability and Health Promotion 3 hours.

Examines health issues in disability with emphasis on health promotion and preventing secondary disease. Relationship of emerging theories of health promotion to disability are discussed.

541

Advanced Concepts in Disability Research 3 hours.

Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews. **Same as** DIS 541.

546

Qualitative Methods in Disability Research 4 hours.

Examines qualitative research methods, design, data collection, analysis, and report writing. Issues of ethical conduct, power relationships, and collaborative approaches. **Same as** DIS 546.

551

Computers, Communication, and Controls in Rehabilitation Technology 3 hours.

Provides information on operation and use of alternative controls for computers, augmentative communication devices, and powered mobility. Emphasis on matching consumer's need and assistive technology. **Same as** OT 551.

Recommended background:

Speech-language pathology, occupational therapy, special education.

552

Seating and Wheeled Mobility 3 hours.

Focuses on issues of wheelchair seating, positioning, and mobility for children and adults with physical disabilities. Assessment procedures, technology selection, current research, and analysis of funding sources. **Prerequisite(s):** DHD



440 or consent of the instructor.
Recommended background: Physical therapy, occupational therapy, speech-language pathology, special education, engineering.

553
Program Evaluation: Documenting the Impact of Human Services 3 hours.
Examines methods in program evaluation with emphasis on empowerment and participatory evaluation. Students will study quantitative and qualitative strategies, how to communicate information to stakeholders, and how to design evaluations. **Same as** OT 553.

Recommended background: Interest in research, health or behavioral sciences, and implementation and evaluation of community initiatives and community-based organizations.

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(s):** DHD 440. **Recommended background:** Speech-language pathology, occupational therapy, special education.

560
Behavioral Assessment and Functional Analysis 3 hours.
Concepts and principles for use in behavioral assessment and functional analysis. **Prerequisite(s):** DHD 460; or consent of the instructor.

564
Community Integration in Developmental Disabilities 3 hours.
Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings. **Same as** CHSC 564 and DIS 564.

565
Research Methodology and Outcomes Measures in Rehabilitation Technology 3 hours.
Analyzes the research process in rehabilitation technology and assistive technology and how such analysis leads to the development of a research proposal. Outcome measures related to assistive technology will be evaluated for their applicability. **Same as** OT 565.

Recommended background: Engineering, occupational therapy, physical therapy, special education, and speech and language pathology.

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(s):** DHD 401 or consent of the instructor.

571
Eugenics in America, 1848-1945 4 hours.
Critical examination of the philosophy and practice of eugenics toward people with disabilities during the period from mid-nineteenth to mid-twentieth centuries. **Same as** DIS 571.

572
A Representational History of Disability 4 hours.
Examines historical and contemporary representations of "the body" to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to "aberrant bodies." **Same as** DIS 572. **Prerequisite(s):** Graduate or professional standing.

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(s):** DHD 401 or consent of the instructor.

576
Visualizing the Body 4 hours.
Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history. **Same as** DIS 576. **Prerequisite(s):** Graduate or professional standing.

590
Field Experience in Disability and Human Development 0 TO 12 hours.
Opportunities for guided experience working with agencies, families, and persons with disabilities providing concrete, practical applications of concepts and principles of disability and human development. May be repeated to a maximum of 12 hours. **Prerequisite(s):** DHD 401 and DHD 415; or consent of the instructor.

593
Independent Research 1 TO 8 hours.
Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

594
Advanced Special Topics in Disability and Human Development 1 TO 4 hours.
Systematic study of advanced selected topics in disability and human development. May be repeated. Students may register in more than one section per term.

595
Seminar in Disability and Human Development 1 TO 4 hours.
Identifies and analyzes a broad range of issues related to disability and human development. Topics vary according to student interests and instructor availability. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596
Independent Study 1 TO 4 hours.
Advanced study and analysis of a topic under guidance of a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

597
Project Research 0 TO 16 hours.
Independent research project under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Graduate standing in the MS in Disability and Human Development program and consent of the instructor.

598
Master's Thesis Research 0 TO 16 hours.
Thesis research to fulfill master's degree requirements. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Graduate standing in the MS in Disability and Human Development program and consent of the instructor.

Disability Studies (DIS)
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(s):** DIS 501.

510
Concepts in Interdisciplinary Research on Disability 3 hours.
Core concepts and methodologies of the major research traditions used in disability research. **Same as** DHD 510.

515
Statistical Methods in Disability Studies 3 hours.
Examination of parametric and nonparametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. **Same as** DHD 515. **Prerequisite(s):** An introductory course in statistics.

517
Ethics and Disability: Contemporary Problems 3 hours.
Ethical theories and ethical decision making are examined from an interdisciplinary disability studies perspective in relation to people with disabilities. Topics include assisted suicide, deinstitutionalization, and genetic discrimination. **Same as** DHD 517. **Prerequisite(s):** DHD 514 or consent of the instructor.

526
Family Perspectives on Disability 3 hours.
Examines trends, theories and research methods, policies, and family-centered intervention approaches for families of persons with disabilities. **Same as** DHD 526 and CHSC 526. **Prerequisite(s):** Consent of the instructor.

535
Advocacy and Empowerment in Disability 3 hours.
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. **Same as** DHD 535.

536
Fatiguing Conditions and Disability 3 hours.
Empirically supported concepts related to assessment and man-



agement of fatiguing conditions. Course also explores the relationship between fatigue and disability from social, psychological, and community-based perspectives.

Same as OT 536.

Recommended background: Health or behavioral sciences.

541

Advanced Concepts in Disability Research 3 hours.

Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews. **Same as** DHD 541.

546

Qualitative Methods in Disability Research 4 hours.

Examines qualitative research methods, design, data collection, analysis, and report writing. Issues of ethical conduct, power relationships, and collaborative approaches.

Same as DHD 546.

550

Disability in the Urban Environment 4 hours.

Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities. **Same as** OT 550.

556

Theory and Methods of Needs Assessment in Aging and Disability 4 hours.

Introduces theories of need, models of the needs assessment process, and reviews research methods typically used in conducting needs assessments. Emphasis will be on needs assessments in health-related community agencies. **Same as** CHSC 556 and OT 556. **Prerequisite(s):** A 400- or 500-level research course such as OT 510, DHD 415, CHSC 446, or SOC 500. The prerequisite research course needs to provide students with an understanding of basic research design, sampling strategies, and an introduction to methods such as surveys and focus groups. **Recommended background:** Health or behavioral sciences, research methods.

564

Community Integration in Developmental Disabilities 3 hours.

Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings. **Same as** CHSC 564 and DHD 564.

571

Eugenics in America, 1848-1945 4 hours.

Critical examination of the philosophy and practice of eugenics toward people with disabilities during the period from mid-nineteenth to mid-twentieth centuries. **Same as** DHD 571.

572

A Representational History of Disability 4 hours.

Examines historical and contemporary representations of "the body" to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to "aberrant bodies." **Same as** DHD 572. **Prerequisite(s):** Graduate or professional standing.

576

Visualizing the Body 4 hours.

Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history. **Same as** DHD 576. **Prerequisite(s):** Graduate or professional standing.

589

Current Research in Disability Studies 1 hour.

A review of the current primary source literature in the area of disability research. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 10 hours. **Prerequisite(s):** Consent of the instructor.

590

Research Project in Disability Studies 1 TO 8 hours.

Formal research project for students not having prior research experience. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

593

Independent Research in Disability Studies 1 TO 8 hours.

Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

594

Special Topics in Disability Studies 1 TO 4 hours.

Systematic study of advanced selected topics in disability studies. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595

Interdisciplinary Seminar in Disability Studies 1 hour.

Students, faculty, and guest speakers present topics addressing current issues in research in the area of disability studies.

Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 4 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the faculty adviser.

596

Independent Study 1 TO 4 hours.

Advanced study and analysis of a topic under guidance of a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

599

PhD Thesis Research 0 TO 16 hours.

Independent research in one area of disability studies. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Graduate standing in the PhD in Disability Studies program and 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. **Prerequisite(s):** EAES 330 and EAES 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(s):** 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(s):** 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(s): 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(s):** 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 materials. **Prerequisite(s):** Consent of the instructor.

430

Igneous Petrology 4 hours.

Discussion of petrogenesis, application of thermodynamic principles to the crystallization of rocks. **Prerequisite(s):** 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. **Prerequisite(s):** EAES 102 and MATH 180; and either PHYS 105 and 106 or PHYS 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. **Prerequisite(s):** EAES 440 and MATH 181, and either PHYS

107 and 108 or PHYS 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.

Prerequisite(s): MATH 180; and PHYS 107 and 108 or PHYS 142; or consent of the instructor.

455

Clastic Sedimentology and Sequence Stratigraphy 4 hours.

Processes, facies, and sedimentary architecture in fluvial, deltaic, coastal, and offshore marine clastic depositional environments. Relative sea-level change and its controls on the stratigraphic record. Basin and reservoir modeling. Field trips required at nominal fee. **Prerequisite(s):** EAES 350 or consent of the instructor.

466

Principles of Paleontology 4 hours.

Theory and methods of evolutionary paleobiology; includes paleoecology, functional morphology, and major features of organic evolution. **Same as** BIOS 466.

Prerequisite(s): EAES 360 or BIOS 360 or 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 modeling approaches. **Prerequisite(s):** EAES 101 and MATH 181.

475

Hydrology/ Hydrogeology 4 hours.

The occurrence, storage, movement, and quality of water above, on, and below the Earth's surface. Topics progress through atmospheric water vapor processes, Earth surface hydrology, and groundwater hydrology. Field trip required at nominal fee.

Prerequisite(s): 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(s): Consent of the instructor.

488

Instrumental Analysis 3 hours.

Scanning electron microscopy with energy-dispersive system. DC plasma analysis.

Prerequisite(s): CHEM 114 and EAES 220; or consent of the instructor.

492

Internship in the Earth and Environmental Sciences 1 hour.

Off-campus participation in governmental or private-sector training program. Credit is contingent on submission of a final report. Satisfactory/Unsatisfactory grading only. May be repeated with approval. A combined maximum of 6 hours of credit in EAES 492 and EAES 396 may be applied toward the degree. **Prerequisite(s):** Approval of the department.

494

Current Topics in Earth and Environmental Sciences 4 hours.

Discussion of current research topics in earth and environmental sciences. **Prerequisite(s):** Consent of the instructor.

Recommended background:

Senior standing and 12 hours of advanced courses in earth and environmental sciences.

510

Advanced Geochemistry 3 TO 4 hours.

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. May be repeated if topics vary.

Prerequisite(s): Consent of the instructor. **Recommended background:** Credit in EAES 410.

516

Advanced Organic Geochemistry/ Biochemistry 4 hours.

Carbon biogeochemical cycle, carbon fixation and carbon isotope fractionation, compound specific isotope analysis, biomarker geochemistry, paleoenvironment.

Prerequisite(s): EAES 416 or consent of the instructor.

520

Advanced Mineralogy 4 hours.

Various types in one of the following categories: structural determination, advanced diffraction techniques, crystal chemistry, and structural mineralogy. Lectures, seminars, and laboratory. May be repeated if topics vary.

Prerequisite(s): Consent of the instructor.

530

Advanced Petrology 3 TO 4 hours.

Selected topics: generation and properties of magmas, formation of metamorphic rocks, reaction rates in metamorphic rocks. May be repeated if topics vary.

Prerequisite(s): Consent of the instructor. **Recommended background:** Credit in EAES 430.

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(s): EAES 444 or consent of the instructor.

543

Advanced Geophysics and Plate Tectonics 4 hours.

Advanced topics in geophysics and plate tectonics, including subjects such as mantle convection, driving forces of plate tectonics, and evolution of rifted continental margins. May be repeated if topics vary. Students may register in more than one section per term.

Prerequisite(s): EAES 444 or EAES 448.

545

Spatial and Temporal Analysis and Modeling 4 hours.

Methods for the analysis and modeling of spatial and temporal patterns in the earth and environmental sciences. Data acquisition.

Prerequisite(s): Graduate standing; and consent of the instructor.

555

Advanced Sedimentary Geology 3 hours.

Advanced topics in modern sedimentology and stratigraphy. May be repeated if topics vary. Field trips required at nominal fee.

Prerequisite(s): EAES 455 or consent of the instructor.

560

Topics in Paleontology 3 TO 4 hours.

In-depth analysis of current problems and issues in paleontology, involving reading primary literature, student presentations, and critical discussions. **Same as** BIOS 560. May be repeated if topics vary. **Prerequisite(s):** Consent of the instructor.

570

Advanced Surficial Processes 4 hours.

Advanced topics in theoretical, empirical, and applied aspects of hillslope processes, sediment transport mechanics, river mechanics, weathering and soil development, or drainage basin development. May be repeated if topics vary. **Prerequisite(s):** EAES 470.

572

Quaternary Environmental Systems 3 hours.

Interrelations between eolian, lacustrine, marine, and glacial environments for the past 1.8 million years; geochronologic and isotopic methods; stratigraphic and geomorphic approaches.

Prerequisite(s): EAES 470.

575

Advanced Hydrology 3 hours.

Selective topics; mechanics of near-surface groundwater, flow in fractured rocks, groundwater contamination, unsaturated-saturated flow, surface-groundwater interactions. May be repeated if topics vary. **Prerequisite(s):** EAES 475.

576

Paleoclimatology 3 hours.

Principles of climatology and paleoclimatology; mechanisms and causes of climate change for the past 63 million years; geologic records of climate and modeling.

Prerequisite(s): EAES 470.

580

Aquatic Science 3 hours.

Addresses environmental issues related to lakes, rivers, estuaries, and coastal zones. Topics will cover sampling techniques, impact of humans, and global change. Field trip required at nominal fee.

Prerequisite(s): EAES 475; or consent of the instructor.

595

Departmental Seminar 1 hour.

Special one-hour seminar, every Thursday, by invited speakers from other earth and environmental sciences departments, governmental agencies, and industry. Satisfactory/Unsatisfactory grading only.





596

**Advanced Studies
in Earth and
Environmental
Sciences****1 TO 6 hours.**

Independent study or research with faculty supervision, leading to a written report. May be repeated. A maximum of 4 hours of credit may be applied toward the requirements for the MS degree.

Prerequisite(s): 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.**

Individual work under the supervision of faculty members in their respective fields.

Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Consent of the thesis supervisor.

599

PhD Thesis**Research** **0 TO 16 hours.**

Individual work under the supervision of faculty members in their respective fields.

Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Consent of the thesis supervisor.

**Economics
(ECON)**

436

Mathematical**Economics** **3 OR 4 hours.**

Application of mathematics to theories of consumer and producer behavior, determination of prices in markets, growth, and stability features of macroeconomic models. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECON 218 or ECON 220; and either ECON 345 or MATH 165 or MATH 180.

441

Teaching Methods in**Economics** **3 OR 4 hours.**

Develops skills in preparing and giving lectures and examinations, computer usage, and other aspects of teaching economics and consumer economics at secondary/higher education levels. 3 undergraduate hours. 4 graduate hours. Credit earned in ECON 441 may not be used to satisfy Economics credit requirements for the BA, BS, MA, or PhD degrees awarded by the Department of Economics. Credit earned in ECON 441 may be applied toward the degree as an elective.

Prerequisite(s): For undergraduate students, two 300- or 400-level electives in economics; for graduate

students in economics, one course in graduate-level microeconomics or macroeconomics.

442

Topics in Economic**Education** **1 TO 4 hours.**

Topics vary. Course content is announced prior to each term in which it is given. May be repeated for credit. Students may register for more than one section per term. Credit for this course may not be used to satisfy the minimum number of economics credit hours needed for the BA, BS, MA, or PhD in Economics. It may be used as general elective credit for these degree programs or as the Economic Education course requirement for the Certificate in the Teaching of Economics.

Prerequisite(s): Consent of the instructor. Prerequisites may vary according to topic.

450

Business Forecasting**Using Time****Series Methods 3 OR 4 hours.**

Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multi-variable transfer function models.

Same as IDS 476. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IDS 371 or ECON 346 or consent of the instructor.

472

Real Estate**Finance** **3 OR 4 hours.**

Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. **Same as** FIN 472. 3 undergraduate hours. 4 graduate hours. May not be used to satisfy the economics credit requirement for the MA in Economics and PhD in Economics. Elective credit only will be applied toward these degrees.

Prerequisite(s): ECON 218 or ECON 220.

475

**Real Estate
Markets and
Valuation****3 OR 4 hours.**

Real estate market analysis. Sales comparison, cost, and income approaches to estimating residential and commercial property values. Statistical procedures for real estate analysis. 3 undergraduate hours. 4 graduate hours. Course may not be applied toward the minimum required courses in economics for the MA or PhD in Economics.

Prerequisite(s): ECON 218 or ECON 220; and ECON 270 or IDS 270; 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(s): Senior standing in the College of Business Administration and completion of all other CBA core courses, or 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. **Prerequisite(s):** Graduate standing and 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(s):** ECON 501 or ECON 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. **Prerequisite(s):** ECON 220 and MATH 165.

502

Microeconomics II **4 hours.**

Advanced microeconomic theory. Theories of consumer behavior, uncertainty, general equilibrium, welfare economics.

Prerequisite(s): ECON 501.

504

**The Economics
of Organization
of Business****Enterprises** **4 hours.**

The economic reasons for the existence of firms, the determinants of firm size, and the theory of organizational structure.

Prerequisite(s): 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(s):** 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(s):** 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(s):** ECON 512.

514

International**Trade Policy** **4 hours.**

Theoretical models on the causes and consequences of international trade and their empirical validation. Effects of tariff and nontariff trade policies and preferential trade agreements.

Prerequisite(s): ECON 501; or ECON 520 and ECON 521.

515

International**Monetary Policy** **4 hours.**

Capital mobility and stabilization policy under fixed and flexible exchange rates; optimum currency areas; reform of international monetary system; problems of liquidity adjustment and confidence.

Prerequisite(s): ECON 511 or ECON 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(s): ECON 501 or ECON 520 or consent of the instructor.

520

**Microeconomics
for Business****Decisions** **4 hours.**

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 versus equity, social welfare.

Credit is not given for ECON 520 if the student has credit in ECON 501 or ECON 540 or MBA 502.

Prerequisite(s): MATH 165 or MATH 181 or the equivalent.

521

Macro and International Economics for Business

4 hours.

Impact of the macro economy and international economics on business decisions. Determination of economic activity, inflation, interest rates, and exchange rates. Role of monetary and fiscal policy. Credit is not given for ECON 521 if the student has credit in ECON 511 or MBA 502 and MBA 508.

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(s): ECON 501 or ECON 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(s): ECON 501 or ECON 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(s): ECON 501 or ECON 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(s): 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(s):** 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(s): MATH 181.

537

Business Research and Forecasting I

4 hours.

The role of research in business; forecasting methods and techniques, including models and their applications. **Same as** IDS 582.

Prerequisite(s): ECON 534 and at least one statistics course with regression analysis at the 300-level or above.

538

Business Research and Forecasting II

4 hours.

The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. **Same as** IDS 583.

Prerequisite(s): IDS 476 or IDS 582 or ECON 537.

539

Microeconometrics

4 hours.

Application of econometric techniques to empirical problems in microeconomics with emphasis on issues of identification and causality; and the selection, implementation, and testing of statistical models. **Prerequisite(s):** ECON 501 and ECON 535.

540

Economics for the Noneconomists

4 hours.

Basic introduction to economics for graduate and professional school students. Supply/demand, opportunity cost, economic behavior of consumers/business firms, macroeconomy, inflation, and business cycles. Credit is not given for ECON 540 if the student has credit in ECON 501 or ECON 520. No graduation credit given to students enrolled in MBA, MA, or PhD in Economics, or PhD in Business Administration.

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 socioeconomic structure (e.g., income distribution, fertility patterns, ethnic group differences). **Prerequisite(s):** ECON 501 or ECON 520.

552

Economic Demography

4 hours.

Economic analysis of fertility (number and timing of children), mortality, marriage and divorce, population age structure, the relationship between population growth and economic development. **Prerequisite(s):** ECON 501 or ECON 520.

553

Economics of Religion

4 hours.

The economic determinants of participation in religious activities; the effects of religion on economic and demographic behavior, health, and well-being. **Prerequisite(s):** ECON 501 or ECON 520.

555

Health Economics I

4 hours.

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(s):** ECON 501 or ECON 520; or consent of the instructor.

556

Health Economics II

4 hours.

Economics of health-related behaviors, prevention and health promotion, health disparities, health and development, evaluation of health-related interests. **Prerequisite(s):** ECON 501 or ECON 520; or consent of the instructor.

560

Industrial Organization

4 hours.

Analysis of industry structure, behavior and performance; firms in imperfect competition; concentration measurement; oligopoly; theory; cartels; price discrimination; vertical and horizontal integration. **Prerequisite(s):** ECON 501 or ECON 520 or consent of the instructor.

570

Environmental and Natural Resource Economics

4 hours.

Analytical methods for evaluating the impacts and control costs of pollution externalities and natural resource changes. Consequent implications for public and business policy. **Prerequisite(s):** 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(s): ECON 501 or ECON 520.

572

Urban Economics

4 hours.

Urban economic models and economic analysis of urban problems. Firm location, housing, transportation, local public finance.

Prerequisite(s): ECON 501 or ECON 520.

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(s):** ECON 501 or ECON 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(s): ECON 501 or ECON 520.

592

Workshop in Economics

4 hours.

Bridges the transition from course work to dissertation research. The nature of a PhD dissertation, topic selection, career design, research support networks. Students define a potential dissertation topic, survey the literature, and present it in class. **Prerequisite(s):** 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. **Prerequisite(s):** 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(s):** Consent of the instructor.

598

Master's Thesis**Research 0 TO 16 hours.**

Research on MA thesis. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the chair of the Thesis Committee.

599

PhD Thesis**Research 0 TO 16 hours.**

Research on a PhD thesis. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the chair of the Thesis Committee.

Education (ED)

402

Philosophy of Education and**Urban School Policy 3 hours.**

Selected social and education philosophies and their impact on urban school curriculum design, school organization and control.

403

Policy Issues in the History of American**Education 3 hours.**

Political, economic, and cultural influences shaping the development of American education policy; emphasis on issues of education theory and practice in their historical settings.

421

Advanced Educational Psychology**3 hours.**

Examines current theory and research on the teaching-learning process with particular attention to general learning and curriculum-relevant problem-solving skills.

Prerequisite(s): ED 210 or graduate standing.

422

Advanced Developmental Psychology and Educational Processes**3 hours.**

Focuses on cognitive and social development from birth to adolescence. Examines relations between development, learning, and educational processes. **Same as PSCH 422. Prerequisite(s):** PSCH 100 and any one from ED 210, PSCH 259, PSCH 320; or graduate standing and consent of the instructor.

429

Practicum in Secondary Classrooms**2 hours.**

Students will observe secondary classrooms, tutor individuals, and teach small groups. Discussions explore curriculum, instruction, and assessment practices within content areas and cultural contexts. **Prerequisite(s):** Admission into a secondary teacher education program and graduate standing. Must enroll concurrently in ED 430.

430

Curriculum, Instruction, and Evaluation in Education**3 hours.**

Introduction to curriculum, instruction, and evaluation as areas of inquiry; implications of these areas of inquiry for educational practice; related contemporary problems and issues. **Prerequisite(s):** Admission to graduate study in education, or consent of the instructor.

431

Improving Learning Environments**3 hours.**

Analysis of structural, normative, and social dimensions of learning environments and their relationships to student learning. Exploration of change processes to improve those environments.

Prerequisite(s): Graduate standing or consent of the instructor.

432

Instruction and Evaluation in Secondary Education**5 hours.**

Instructional planning and curriculum design; strategies for instruction and classroom management; forms of formative and summative evaluation; and professional development issues. Fieldwork required.

Prerequisite(s): Completion of education core courses in undergraduate teacher certification program: ED 200 and ED 210 or, in graduate teacher certification program: ED 402 or ED 403 or PS 401; and ED 421 or ED 422 or ED 445.

445

Adolescence and the Schools**3 hours.**

Physiological, intellectual, and social development of adolescence. Relations between aspects of adolescent development and the academic and social demands of secondary schools.

Prerequisite(s): ED 210 or the equivalent, or graduate standing.

450

Composing a Teaching Life I**15 hours.**

Begins the capstone experience of the program, full-time student teaching in an elementary classroom. It is accompanied with a weekly seminar to discuss experiences, reason about learning, and reflect on students' own learning. **Prerequisite(s):** Senior standing or above and admission to the Bachelor of Arts in Elementary Education program.

451

Composing a Teaching Life II/ Senior Reflective Seminar**5 hours.**

Provides the capstone experience for students, with a weekly Senior Reflective Seminar in which students reflect upon their teaching through the lenses of the five program curricular strands. Fieldwork required. **Prerequisite(s):** Admission to the Bachelor of Arts in Elementary Education program. Senior standing and successful completion of ED 450.

461

Political and Sociocultural Perspectives on Special Education**3 hours.**

Students will examine issues of access and equity through legislation, litigation, and sociocultural perspectives and be introduced to major theoretical frameworks that influence special education programs. **Same as SPED 461.** Fieldwork required.

470

Educational Practice with Seminar I**6 hours.**

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the college. **Prerequisite(s):** 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.**

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the college. **Prerequisite(s):** Good academic standing in a

teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in ED 470, and approval of the college or department of specialization.

472

Promoting Academic and Prosocial Behavior I**3 hours.**

The importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. **Same as SPED 472.**

Fieldwork required. **Prerequisite(s):** SPED 461 or ED 461 or the equivalent or consent of the instructor.

473

Teaching Math and Science with Adaptations**3 hours.**

Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. **Same as SPED 473.** Fieldwork required.

Prerequisite(s): SPED 461 or ED 461 or the equivalent or consent of the instructor.

500

Philosophical Foundations of Educational Inquiry**4 hours.**

Philosophical foundations of various forms of educational inquiry. Epistemological and ethical dimensions of different research approaches. **Prerequisite(s):** Admission to the PhD in Education program or consent of the instructor.

501

Data and Interpretation in Educational Inquiry**4 hours.**

Data, interpretation, reliability, validity, accuracy, stability, and generalizability from different methodological perspectives; how research design, data collection, and interpretation vary with different philosophical approaches.

Prerequisite(s): Admission to the PhD in Education program or consent of the instructor.

502

Essentials of Qualitative Inquiry in Education**4 hours.**

Hands-on introduction to qualitative research methods, including foundations, practices, and ethics in qualitative research.

Prerequisite(s): Admission to



the PhD in Education program or consent of the instructor.

**503
Essentials of
Quantitative
Inquiry in
Education 4 hours.**

Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). **Same as** EPSY 503.

Prerequisite(s): Admission to the PhD in Education program or consent of the instructor.

**543
Research on
Teaching 4 hours.**

Review and analysis of history, paradigms, methods, and findings of research on teaching. Focus on the development of research questions and strategy.

Prerequisite(s): ED 490 or ED 503 or CIE 578; and consent of the instructor.

**544
Research Design 4 hours.**

Alternative research design models and evaluation methodologies; quantitative and qualitative approaches; ethnography; historiography; experimentation and quasi-experimentation; institutional and practitioner research designs and methods. May be repeated.

Prerequisite(s): Admission to the PhD in Policy Studies in Urban Education (Educational Organization and Leadership Concentration) or the EdD in Urban School Leadership Program and consent of the instructor.

**580
Colloquium on
Diversity in Secondary
Education 2 hours.**

Designed to provide candidates with opportunities to interact with experts who deal with various issues of diversity in education, to discuss those issues with their cohorts, and to explore ways of meeting students' diverse needs. Satisfactory/Unsatisfactory grading only.

**594
Special Topics
in Education 1 TO 4 hours.**

Exploration of a topic not covered in existing course offerings. May be repeated if topics vary. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

**596
Independent
Study 1 TO 4 hours.**

Students independently study related topics not covered by course, under faculty supervision. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the adviser.

**Educational
Psychology
(EPSY)**

**420
Social Development
of Urban
Children 3 OR 4 hours.**

General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles.

Same as PSCH 420. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Admission to a graduate program in education or psychology, or consent of the instructor.

**429
Constructivist Approaches
to Development:
Piaget and
Vygotsky 3 OR 4 hours.**

Piaget's and Vygotsky's theories of development of knowledge.

Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language.

Same as PSCH 429. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ED 422 or PSCH 422 or the equivalent and graduate standing in education or graduate standing in psychology or consent of the instructor.

**446
Characteristics of
Early Adolescence 3 hours.**

Physiological, social, emotional, and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. **Same as** PSCH 423.

Prerequisite(s): ED 210 or ED 421 or ED 422 or PSCH 422 or the equivalent, and approval of the College of Education; or admission to the PhD in Psychology program; or consent of the instructor.

**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(s): ED 210 or the equivalent.

**465
Cognitive
Development and
Disabilities 3 hours.**

Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and intervention.

Same as SPED 465. Fieldwork required. **Prerequisite(s):** SPED 461 or ED 461 or the equivalent or consent of the instructor.

**466
Language
Development,
Diversity, and
Disabilities 3 hours.**

Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention.

Same as SPED 466. Fieldwork required. **Prerequisite(s):** SPED 461 or ED 461 or the equivalent or consent of the instructor.

**467
Social and
Emotional Development
and Disabilities 3 hours.**

Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5–21 with and without disabilities. **Same as** SPED 467. Fieldwork required.

Prerequisite(s): SPED 461 or ED 461 or the equivalent or consent of the instructor.

**494
Topics in Educational
Psychology 1 TO 4 hours.**

Seminar on a preannounced topic focusing on methodology, research, and educational implications of recent models of learning, problem solving, and thinking. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Consent of the instructor.

**496
Independent
Study 1 TO 4 hours.**

Students carry out independent study under the direction of educational psychology faculty member. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

**500
Proseminar in
Educational
Psychology 2 hours.**

Interdisciplinary colloquia on selected topics in educational psy-

chology. Serves as introduction to faculty research foci. **Same as** PSCH 550. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Admission to the PhD in Education program or the PhD in Psychology program, or consent of the instructor.

**501
Cognition and
Instruction 4 hours.**

Current research on relations among cognitive processes, learning, and instruction. **Same as** PSCH 551. **Prerequisite(s):** Admission to the PhD in Education program or the PhD in Psychology program, or consent of the instructor.

**502
Social Psychology
of Education 4 hours.**

Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. **Same as** PSCH 517.

Prerequisite(s): Admission to the PhD in Education program or the PhD in Psychology program; or consent of the instructor.

**503
Essentials of
Quantitative Inquiry
in Education 4 hours.**

Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance).

Same as ED 503. **Prerequisite(s):** Admission to the PhD in Education program or consent of the instructor.

**504
Rating Scale and
Questionnaire Design
and Analysis 4 hours.**

Development and administration of rating scales and questionnaires, analysis of data, and reporting of results. The focus is on rating scales. **Same as** PSCH 504.

Previously listed as EPSY 550. **Prerequisite(s):** ED 501, and ED 503 or EPSY 503 or the equivalents or consent of the instructor.

**506
Item Response
Theory/Rasch
Measurement 4 hours.**

Statistical inference with item response theory models, useful to measure an individual's performance on a test or questionnaire. Models include parametric, nonparametric, unidimensional, multidimensional, and cognitive. **Same as** PSCH 506.



May be repeated to a maximum of 8 hours. Extensive computer use required. **Prerequisite(s):** ED 501 and EPSY 503 and EPSY 546 or the equivalent. Appropriate score on the department placement test. Graduate or professional standing required or consent of the instructor.

509
Introduction to Research Design in Education 3 hours.
Introduction to educational research design and literature. Emphasis is placed on learning the fundamental techniques of social science inquiry as they apply to educational issues.

514
Nonparametric Statistics and Regression 4 hours.
Distribution free statistical tests that are robust for small samples. Also, nonparametric (nonlinear) regression models that relax the assumptions of classical linear regression. **Prerequisite(s):** ED 501 and EPSY 503 or the equivalent; and appropriate score on the department placement test.

519
Curriculum, Instruction, and Assessment in Early Primary Grades 5 hours.
Language arts, mathematics, science, social studies, and fine arts curriculum development and instruction in the primary grades. **Prerequisite(s):** EPSY 429 and EPSY 520; and consent of the instructor.

520
Curriculum and Practice in Early Childhood Education I 5 hours.
Examines curriculum models and methods for fostering learning and development in early childhood. Provides extensive clinical experience in early childhood classrooms. **Prerequisite(s):** EPSY 429 and ED 422; and consent of the instructor.

521
Early Childhood Education Student Teaching 10 hours.
Instructional methods and curricula in the early childhood classrooms. Discussion of program and child evaluation. Includes full-time supervised student teaching. Meets Illinois State Board of Education requirement for Type 04 Certification by providing supervised student teaching experience. **Prerequisite(s):** EPSY 519 and EPSY 520; and consent of the instructor.

522
Student Teaching in the Primary Grades 6 hours.
Instructional methods in curricula in primary grades. Meets Illinois State Board of Education requirement for Type 04 Certification. Fieldwork required. Meets 8 weeks of the semester. **Prerequisite(s):** EPSY 519; and consent of the instructor.

524
Parent and Staff Relations in Early Education 4 hours.
Methods for involving parents in early childhood programs. The role of the director in program administration and in hiring, training, and supervising teachers and staff. **Prerequisite(s):** Consent of the instructor.

525
Advanced Adolescent Development 3 hours.
Examines current theory and research on physiological, intellectual, emotional, and social development during the adolescent years. Examines relationship amongst individual, interpersonal, and contextual factors related to adolescent development. **Prerequisite(s):** EPSY 446 or EPSY 502 or ED 421 or ED 422 or ED 445; or consent of the instructor. **Recommended background:** Course work in Educational Psychology or Psychology.

526
Development in Infancy and Early Childhood 4 hours.
Consideration of development in the preschool years. Stress on theory, research, individual child study, and educational implications. **Same as** PSCH 520. **Prerequisite(s):** ED 422 or PSCH 422 or the equivalent.

527
Seminar in Moral Development, Character Formation, and Education 4 hours.
Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. **Same as** PSCH 527. **Prerequisite(s):** ED 422 or PSCH 422 or the equivalent, or admission to the PhD in Education program, PhD in Psychology program, or PhD in Social Work program, or consent of the instructor.

529
Cognition and Instruction: Advanced Constructivist Approaches 4 hours.
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. **Same as** PSCH 552. **Prerequisite(s):** EPSY 429 or PSCH 429 or the equivalent, and admission into a PhD program in the College of Education or Psychology or consent of instructor.

530
Achievement Motivation 4 hours.
The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. **Same as** PSCH 525. **Prerequisite(s):** Graduate standing in education or psychology or consent of the instructor.

546
Educational Measurement 4 hours.
Introduces methods based on true score theory, generalizability theory, and Rasch measurement that are used to address issues of reliability and validity. **Prerequisite(s):** ED 501, and ED 503 or EPSY 503 or the equivalent or consent of the instructor.

547
Multiple Regression in Educational Research 4 hours.
Introduction to multiple correlation and regression techniques as tools for the analysis and interpretation of educational and behavioral science data. **Prerequisite(s):** EPSY 503.

553
Assessment for Teachers 4 hours.
Plan, construct, administer, score, and report on classroom assessments that measure a wide variety of learning outcomes, from simple to complex; select and use standardized achievement tests; developing defensible grading procedures. **Prerequisite(s):** EPSY 421 and EPSY 422; or consent of the instructor.

560
Educational Program Evaluation 4 hours.
An introduction to concepts, approaches, techniques, and practices of educational program evaluation. Students work toward

acquiring knowledge and skills to plan and conduct evaluations of programs, projects, curriculum and institutions. **Prerequisite(s):** ED 501 and EPSY 503; or consent of the instructor.

561
Assessment for Measurement Professionals 4 hours.
Plan, construct, administer, score, and report on classroom assessment; select and use standardized achievement tests; develop defensible grade procedures; measure issues in classroom assessment; validity and reliability of classroom assessments. **Prerequisite(s):** ED 421 and ED 422; 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(s):** EPSY 503.

582
Forging Collaborations with Family and Community 3 hours.
Develops skills necessary to work in partnership with the families of children with disabilities, and community members. **Same as** SPED 582. **Prerequisite(s):** ED 461 or SPED 461 or the equivalent or consent of the instructor.

583
Multivariate Analysis of Educational Data 4 hours.
Introduction to multivariate statistical methods in education including data screening, canonical correlation, MANOVA/MANCOVA, DFA, profile analysis, component/factor analysis, confirmatory factor analysis, and structural equation modeling. **Prerequisite(s):** EPSY 547 or EPSY 563.

588
Current and Specialized Topics in Psychometrics 2 hours.
Seminar on current and specialized topics in psychometrics. Satisfactory/Unsatisfactory grading only. May be repeated. Extensive computer use required. **Prerequisite(s):** Credit or concurrent registration in EPSY 546 or credit or concurrent registration in EPSY 550; and credit or concurrent registration in EPSY 503; or consent of the instructor.





589

Topics in Educational Statistics 4 hours.

Seminar on a preannounced topic on educational statistical methodology for the analysis of educational data. May be repeated.

Prerequisite(s): EPSY 547.

593

PhD Research**Project 1 TO 8 hours.**

Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. May be repeated to a maximum of 8 hours.

Prerequisite(s): Admission to the PhD in Education program.

594

Special Topics in Educational Psychology 1 TO 4 hours.

Seminar on a preannounced topic focusing on methodology, research, and educational implications of recent models of learning, problem solving, and thinking. May be repeated to a maximum of 12 hours. **Prerequisite(s):** ED 421 and ED 422, or consent of the instructor.

596

Independent**Study 1 TO 4 hours.**

Students carry out independent study in educational psychology under the direction of a faculty member. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

Prerequisite(s): ED 490 or the equivalent, and consent of the adviser and instructor.

599

Thesis Research 0 TO 16 hours.

Research on the topic of the student's dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the dissertation adviser.

Electrical and Computer Engineering (ECE)

400

Introduction to Microelectromechanical Systems 3 OR 4 hours.

Definition, classification, and case studies of transducers, sensors, and actuators. Microfabrication methods for microelectromechanical systems (MEMS). Design, simulation, and modeling of MEMS. 3 undergraduate hours. 4 graduate

hours. **Prerequisite(s):** ECE 346.

401

Quasi-Static Electric and Magnetic Fields 3 OR 4 hours.

Static electric and magnetic fields. Material description, boundary value problems. Field energy, its conversion, and scaling laws. Quasi-static fields, field diffusion, eddy currents, energy losses. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 322.

407

Pattern Recognition I 3 OR 4 hours.

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. **Same as** BIOE 407. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** MATH 220.

410

Network Analysis 3 OR 4 hours.

Matrix algebra for network analysis, network parameters, macro-modeling, high-frequency measurements, network functions and theorems. Topics in computer-aided analysis. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in ECE 310.

412

Introduction to Filter Synthesis 3 OR 4 hours.

Fundamentals of network synthesis, filter approximations, and frequency transformations. Active filter synthesis using bilinear and biquad circuits. Topics in computer-aided design. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in ECE 310.

415

Image Analysis and Computer Vision I 3 OR 4 hours.

Image formation, geometry, and stereo. Two-dimensional image analysis by Fourier and other 2-D transforms. Image enhancement, color, image segmentation, compression, feature extraction, object recognition. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** MATH 310 or a grade of C or better in ECE 310.

417

Digital Signal Processing II 0 TO 5 hours.

Computer-aided design of digital filters; quantization and round-off

effects; FFT algorithms; number-theoretic algorithms; multirate signal processing; DSP architectures and programming. 4 undergraduate hours. 5 graduate hours.

Prerequisite(s): ECE 317.

418

Statistical Digital Signal Processing 3 OR 4 hours.

Stochastic signal models, LMS identification, identification of signals from noise, Wiener filtering, blind separation of mixed signal, discrete Wavelet Transforms, compression and denoising, cepstral analysis. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 317 and ECE 341.

421

Introduction to Antennas and Wireless Propagation 3 OR 4 hours.

Potential, antenna parameters, radiation from linear wires and loops, impedance, arrays, communication links and path loss, tropospheric propagation, fading and diversity. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 225 and ECE 322.

423

Electromagnetic Compatibility 3 OR 4 hours.

EMC requirements for electronic systems. Nonideal behavior of components. Radiated and conducted emissions. Susceptibility. Coupling and shielding. Electrostatic discharge. System design for EMS. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ECE 320 and ECE 322.

424

RF and Microwave-Guided Propagation 0 TO 5 hours.

Maxwell's equations, transmission lines, Smith chart, strip lines, rectangular and circular waveguides, TE and TM waves, wave impedance, resonators, two-port parameters, power and energy considerations. 4 undergraduate hours. 5 graduate hours.

Prerequisite(s): ECE 225 and ECE 322.

427

Modern Linear Optics 3 OR 4 hours.

Geometrical optics, wave optics, two-dimensional Fourier analysis, scalar diffraction theory, Fourier transforming properties of lenses, coherent and incoherent images, holography, electromagnetic optics, polarization and crystal optics, resonators. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ECE 310 and ECE 322.

431

Analog Communication Circuits 0 TO 5 hours.

Introduction to radio frequency circuit design: narrowband transistor amplifiers, impedance matching networks, oscillators, mixers, amplitude and frequency modulation/demodulation, phase-lock loop circuits, amplifier noise and stability analysis. Laboratory. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** ECE 311 and ECE 340.

432

Digital Communications 3 OR 4 hours.

Source coding, quantization, signal representation, channel noise, optimum signal reception, digital modulation: ASK, PSK, FSK, MSK, M-ary modulation. Probability of error. Intersymbol interference. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 311 and ECE 341.

434

Multimedia Systems 3 OR 4 hours.

Multimedia systems; compression standards; asynchronous transfer mode; Internet; wireless networks; television; videoconferencing; telephony; applications. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** ECE 333.

435

Wireless Communication Networks 3 OR 4 hours.

Radio technology fundamentals; channel and propagation models; channel multiple access technologies; wireless mobile communication fundamentals; generic wireless mobile network; cellular/PCS wireless mobile network standards. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ECE 432 and ECE 333.

436

Computer Communication Networks II 3 OR 4 hours.

Explores integrated network architecture of service, control signaling and management, examples of high-speed LAN/WAN, next generation Internet, and mobile wireless network. 3 undergraduate hours. 4 graduate hours. Extensive computer use required.

Prerequisite(s): ECE 333.

437

Wireless**Communications 3 OR 4 hours.**

Cellular concept, frequency reuse, mobile radio propagation, channel fading, noise in analog communications, mobile radio channel equalization, multiple access techniques (FDMA, TDMA, CDMA), wireless networking. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ECE 311 and ECE 341.

442

Power Semiconductor Devices and Integrated Circuits 0 TO 5 hours.

Covers the physics of devices encountered in the power-electronic and switching converter systems. 4 undergraduate hours. 5 graduate hours. Credit is not given for ECE 442 if the student has credit for EECS 442. ECE 442 is a supplement for ECE 445 and ECE 545. **Prerequisite(s):** ECE 342 and ECE 346.

445

Analysis and Design of Power Electronic Circuits 0 TO 5 hours.

Analysis of different isolated and nonisolated power-converter topologies, understanding of power-converter components, switching schemes. 4 undergraduate hours. 5 graduate hours.

Prerequisite(s): ECE 342 and a grade of C or better in ECE 310.

448

Transistors 3 OR 4 hours.

Bipolar junction transistors, electronic processes in surface-controlled semiconductor and dielectric devices. Metal oxide semiconductor field effect transistors, surface and interface effects, diode lasers, integrated optoelectronic devices. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ECE 346.

449

Microdevices and Micromachining Technology 0 TO 5 hours.

Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Simulation experiments. Laboratory. **Same as** ME 449. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** ECE 347.

451

Control Engineering 3 OR 4 hours.

State-space representation of systems; realization theory; stability; performance; modern control

design techniques, including fuzzy, learning, adaptive, and nonlinear control. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ECE 350.

452

Robotics: Algorithms and Control 3 OR 4 hours.

Kinematic and dynamic modeling of robots; configuration space; motion planning algorithms; control of robots; sensors and perception; reasoning; mobile robots. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 201; and a grade of C or better in ECE 210 or a grade of C or better in ECE 225.

458

Electromechanical Energy Conversion 0 TO 4 hours.

Electromagnetic forces and torque; magnetic circuits and transformers; DC machines; three-phase AC synchronous and induction machines; laboratory-demonstrations. Projects are required. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in ECE 225.

465

Digital Systems Design 3 OR 4 hours.

Switching algebra, combinational circuits, Mux, ROM, DCD, PLA-based designs, advanced combinational circuit minimization techniques, synchronous and asynchronous sequential circuit synthesis (minimization, hazards, races, state assignment) testing. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in CS 366 and a grade of C or better in PHYS 142.

466

Computer Architecture 3 OR 4 hours.

Design and analysis of high performance uniprocessors. Topics include arithmetic: multiplication, division, shifting; processor: pipelining, multiple function units. Instructure sets; memory: caches, modules; virtual machines. 3 undergraduate hours. 4 graduate hours. Credit is not given for ECE 466 if the student has credit for CS 466. **Prerequisite(s):** ECE 366.

467

Introduction to VLSI Design 0 TO 5 hours.

MOS, CMOS circuits VLSI technology, CMOS circuit characterization and evaluation. Static and dynamic MOS circuits, system design, faults, testing, and symbolic lay-

out. Laboratory. 4 undergraduate hours. 5 graduate hours.

Prerequisite(s): ECE 340.

468

Analog and Mixed-Signal VLSI Design 0 TO 5 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. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** ECE 467.

469

CAD-Based Computer Design 3 OR 4 hours.

Use of modern CAD tools for computer system design, hardware, description languages, simulation, design verification, synthesis. Design assignments, projects using CAD. 3 undergraduate hours. 4 graduate hours. Credit is not given for ECE 469 if the student has credit for CS 469. Extensive computer use required.

Prerequisite(s): ECE 368 and ECE 465 and ECE 466.

491

Seminar 1 TO 4 hours.

Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the *Schedule of Classes*. May be repeated. **Prerequisite(s):** Consent of the instructor.

493

Special Problems 2 TO 4 hours.

Special problems or reading by special arrangement with the faculty. No graduation credit for students in the following: MS in Electrical and Computer Engineering or PhD in Electrical and Computer Engineering. **Prerequisite(s):** 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(s): ECE 410.

513

Advanced Analog Filter Synthesis 4 hours.

The active biquad, sensitivity analysis, realization of active two-port networks, design of broad-

band matching networks, and the theory of passive cascade synthesis. **Prerequisite(s):** ECE 412.

515

Image Analysis and Computer Vision II 4 hours.

Image analysis techniques, 2-D and 3-D shape representation, segmentation, camera and stereo modeling, motion, generic object and face recognition, parallel and neural architectures for image and visual processing.

Prerequisite(s): ECE 415; or consent of the instructor.

516

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(s): ECE 317 and ECE 341.

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(s):** ECE 317 and ECE 341.

520

Electromagnetic Field Theory 4 hours.

Maxwell's 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(s):** ECE 420 and ECE 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(s):** ECE 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. **Prerequisite(s):** ECE 420 and ECE 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.
Prerequisite(s): ECE 421 and ECE 520.

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(s): ECE 520.

527
Optical Electronics 4 hours.
 Optical resonators. Radiation and atomic systems. Laser oscillation. Laser systems. Parametric amplification and oscillation. Electro-optics and acousto-optics. Phase conjugate optics. Modulation, detection, and noise.
Prerequisite(s): ECE 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(s): ECE 520 or the equivalent.

530
Random Signal Analysis 4 hours.
 Probability for communications, properties and series representations of random processes, random processes through linear and nonlinear systems, minimum MSE and maximum SNR systems.
Prerequisite(s): ECE 341 or consent of the instructor.

531
Detection and Estimation Theory 4 hours.
 Bayes, Neyman-Pearson, and minimum detection for discrete and continuous time random processes. Estimation of random and nonrandom signal parameters. Estimation of signals.
Prerequisite(s): ECE 418 or consent of the instructor.

532
Advanced Digital Communications 4 hours.
 Characteristics of digitally modulated signals; digital signals in

additive noise; communication over fading channels and with intersymbol interference; source and channel coding; synchronization; spread spectrum techniques.
Prerequisite(s): ECE 432 or consent of the instructor.

533
Advanced Computer Communication Networks 4 hours.
 Computer and telecommunication networks; integrated (data, voice, and video) services; network performance; quality of service provisioning.
Prerequisite(s): ECE 333 and ECE 341; or consent of the instructor.

534
Elements of Information Theory 4 hours.
 Entropy and mutual information, fundamentals of coding theory, data compression, complexity of sources, channel mutual information and capacity, rate distortion theory, information theory applications.
Prerequisite(s): ECE 341 or consent of the instructor.

535
Advanced Wireless Communication Networks 4 hours.
 2nd generation: IS-95-based wireless mobile network; 2nd generation: GSM-based wireless mobile network; 2.5 generation: wireless mobile data/voice network; 3rd generation: broadband wireless mobile multimedia network.
Prerequisite(s): ECE 435.

537
Wireless Data Communications and Networking 4 hours.
 The course discusses data services evolution in (2G) wireless systems to achieve specified data rates of 3G. The course focuses on wireless data services in the wide and local area networks.
Prerequisite(s): ECE 432 and ECE 435; and senior standing or above; or consent of the instructor.

540
Physics of Semiconductor Devices 4 hours.
 Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions, in homogeneous semiconductors; recombination and generation; nonequilibrium processes, radiation and electric fields; diodes. **Same as** PHYS 540. **Prerequisite(s):** ECE 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. **Same as** ME 541. **Prerequisite(s):** ECE 347 or ECE 449.

542
Advanced Semiconductor Devices 4 hours.
 Bipolar transistor and related devices, MOSFET transistor and related devices, MESFET and related devices, quantum-effect devices, photonic devices.
Prerequisite(s): ECE 540.

545
Advanced Power-Electronics Design 4 hours.
 High-frequency-magnetics design and measurement, parasitics, modeling, estimation, and measurement, soft switching for DC-DC converters, distributed DC-DC converters, and design layout.
Prerequisite(s): ECE 445.

550
Linear Systems Theory and Design 4 hours.
 State variable description, linear operators, impulse response matrix, controllability, observability, reducible and irreducible realizations, state feedback, state observers and stability.
Prerequisite(s): ECE 350.

551
Optimal Control 4 hours.
 Optimal control of dynamic systems in continuous and discrete time, maximum principle, dynamic programming and constraints, learning systems.
Prerequisite(s): ECE 550 or consent of the instructor.

552
Nonlinear Control 4 hours.
 Nonlinear phenomena, linear and piecewise linear approximations, describing functions, servomechanisms, phase plane, limit cycles, Lyapunov's stability theory, bifurcation, bilinear control, vibrational control, learning systems.
Prerequisite(s): ECE 550 or consent of the instructor.

553
System Identification 4 hours.
 Online and offline identification of control systems in frequency and time domain, considering noise effects, nonlinearities, nonstationarities, and distributed parameters.
Prerequisite(s): ECE 550.

559
Neural Networks 4 hours.
 Artificial neural networks, perceptron, backpropagation, Kohonen nets, statistical methods, Hopfield nets, associative memories, large

memory networks, cognition.
Same as CS 559.
Prerequisite(s): 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(s): Consent of the instructor.

565
VLSI Design Automation 4 hours.
 Computer-aided physical design of integrated circuits; circuit partitioning and placement; floor planning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation.
Prerequisite(s): CS 401 and ECE 465.

566
Parallel Processing 4 hours.
 Parallel processing. Includes multi-computer architectures, parallel programming languages, interconnection networks, and parallel algorithms.
Prerequisite(s): CS 401 and ECE 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 computer-aided design tools.
Prerequisite(s): ECE 467.

568
Advanced Microprocessor Architecture and Design 4 hours.
 Microprocessors; embedded control; processor core; system-on-chip; power-aware design; SMT design; Java processors; media processors; network processors; crypto processors; trusted processor architectures; architecture simulation. Extensive computer use required.
Prerequisite(s): ECE 466 and consent of the instructor.

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(s): ECE 466.





572
Nanoscale Semiconductor Structures: Electronic and Optical Properties 4 hours.

Electronic and optical properties of nanoscale semiconductors and devices, carrier interactions in dimensionally confined nanostructures, deformation potential, piezoelectric potential, polar-optical-phonon interaction potential.

Prerequisite(s): PHYS 244 and ECE 346. **Recommended background:** Background in semiconductor device fundamentals, such as covered in ECE 346 as well as the underlying physical principles as covered in PHYS 244.

594
Special Topics 4 hours.

Subject matter varies from term to term and section to section, depending on the specialities of the instructor. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

595
Departmental Seminar 0 hours.

Seminar by faculty and invited speakers. Satisfactory/Unsatisfactory grading only. May be repeated.

596
Individual Study 1 TO 4 hours.

Individual study or research under close supervision of a faculty member. May be repeated. Students may register in more than one section per term. No graduation credit for students in the following: MS in Electrical and Computer Engineering and PhD in Electrical and Computer Engineering. **Prerequisite(s):** Consent of the instructor.

597
Project Research 0 TO 9 hours.

A research design or reading project approved by the committee appointed by the director of graduate studies. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor. For ECE majors only.

598
MS Thesis Research 0 TO 16 hours.

MS thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students

may register in more than one section per term. **Prerequisite(s):** Consent of the instructor. For ECE majors only.

599
PhD Thesis Research 0 TO 16 hours.

PhD thesis work under supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor. For ECE majors only.

Engineering (ENGR)

400
Engineering Law 3 OR 4 hours.

Overview of the legal system. Legal principles affecting the engineering profession. Professional ethics in engineering. Intellectual property law. Basic contract and tort principles. Environmental law. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Senior standing or above.

401
Engineering Management 3 OR 4 hours.

Theory, strategy, and tactics of the use of project management, including project planning, matrix management concept, and team meetings. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. This is an online Web-based course.

Prerequisite(s): Senior standing or above.

402
Intellectual Property Law 3 OR 4 hours.

Patent, copyright, trade secret, mask work, and cyber-squatting legal and procedural principles; protection for novel software, biotech inventions, and business methods; and trademark protection for domain names. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. This is an online Web-based course. **Prerequisite(s):** Senior standing or above.

403
Reliability Engineering 3 OR 4 hours.

Probability overview; statistics overview; system reliability modeling and prediction-static methods; system reliability modeling and prediction-dynamic methods; maintainability and availability; reliability optimization; and risk analysis. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. This is an

online Web-based course. **Prerequisite(s):** Senior standing or above.

404
Entrepreneurship 3 hours.

Identify new business opportunities in technology, market value assessment, competition, business plan, funding acquisition, intellectual property protection, and case studies. **Prerequisite(s):** Open only to seniors; and consent of the instructor.

410
Wireless Data 3 OR 4 hours.

Data communications, existing wireless data networks, planning, topology, performance, and operation. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. This is an online Web-based course.

Prerequisite(s): A course in digital communications and an introductory course in wireless communications. Graduate or professional standing.

420
Engineering for Success 1 hour.

Interactive seminars will be given by persons with engineering degrees having shown high achievement in either engineering or nonengineering endeavors. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Junior standing or above.

494
Special Topics in Engineering 3 OR 4 hours.

Course on multidisciplinary engineering topics that vary from term to term depending on current student and instructor interests. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Junior standing or above; and consent of the instructor.

English (ENGL)

400
History of the English Language 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Senior standing or above; or consent of the instructor.

Recommended background: ENGL 200.

401
Modern English 3 OR 4 hours.

This is a course on the sound system, the lexicon, and syntax-semantics of modern American English taught from the linguistic perspective. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Senior standing or 9 hours of English or consent of the instructor. **Recommended background:** ENGL 200.

402
Rhetoric 3 OR 4 hours.

Intensive study of central topics in rhetorical theory in their historical depth. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ENGL 342 or ENGL 361 or ENGL 370 or ENGL 372 or ENGL 374 or ENGL 375; and senior standing or above; or consent of the instructor.

403
Introduction to Old English 3 OR 4 hours.

The elements of Old English grammar and readings from the literature of England before the Norman Conquest. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ENGL 240; and ENGL 241 or ENGL 242 or ENGL 243; or consent of the instructor.

405
Topics in Old English Literature 3 OR 4 hours.

Studies in the language and literature of pre-Conquest England. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): ENGL 403; or consent of the instructor.

408
Topics in Medieval Literature 3 OR 4 hours.

Topics in English literature from the period 450-1500. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** ENGL 311 or ENGL 312 or ENGL 313 or ENGL 314; and senior standing or above; or consent of the instructor.

413
Topics in Shakespeare 3 OR 4 hours.

Study of a genre, topic, or period in Shakespeare's work. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): ENGL 312 or ENGL 313 or ENGL 314; and senior standing or above; or consent of the instructor.

416
Topics in Renaissance Literature and Culture 3 OR 4 hours.
 Study of a topic in English literature written between 1500 and 1700. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisites: ENGL 311 or ENGL 312 or ENGL 313 or ENGL 314; and senior standing or above; or consent of the instructor.

417
Topics in Restoration and Eighteenth-Century Literature and Culture 3 OR 4 hours.
 Focus on a particular topic or theme in British literature, 1660–1780. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 313 or ENGL 314 or ENGL 315 or ENGL 316; and senior standing or above; or consent of the instructor.

419
Topics in Romantic Literature and Culture 3 OR 4 hours.
 Concentrates on a particular aspect of British Romantic writing in order to provide a greater depth of study in the period. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 313 or ENGL 314 or ENGL 315 or ENGL 316 or ENGL 317; and senior standing or above; or consent of the instructor.

421
Topics in Victorian Literature 3 OR 4 hours.
 Study of a major author, genre, or theme in the Victorian period. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 315 or ENGL 316 or ENGL 317 or ENGL 318; and senior standing or above; or consent of the instructor.

422
Topics in Postcolonial and World Literature in English 3 OR 4 hours.
 Study of a major author, topic, movement, or genre within postcolonial and world literatures in English. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 318 or ENGL 319 or ENGL 320 or ENGL 333; and senior standing or above; or consent of the instructor.

426
Topics in American Literature and Culture to 1900 3 OR 4 hours.
 This course analyzes selected topics in American literature and culture to 1900. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 323 or ENGL 324 or ENGL 325; and senior standing or above; or consent of the instructor.

427
Topics in American Literature and Culture, 1900–Present 3 OR 4 hours.
 Study of a specific topic relating American literature to society, culture, history, race, gender, ethnicity. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisites: ENGL 324 or ENGL 325 or ENGL 326 or ENGL 327; and senior standing or above; or consent of the instructor.

428
Topics in Literature and Culture, 1900–Present 3 OR 4 hours.
 Study of a specific topic relating twentieth-century literature to society, culture, history, race, gender, ethnicity. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 318 or ENGL 319 or ENGL 320 or ENGL 325 or ENGL 326 or ENGL 327; and senior standing or above; or consent of the instructor.

429
Topics in Literature and Culture 3 OR 4 hours.
 Study of a specific topic relating literature to society, culture, history, race, gender, ethnicity. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): Six hours of English at the 300-level and senior standing or above; or consent of the instructor.

437
Topics in Poetry and Poetic Theory 3 OR 4 hours.
 Investigations into the nature of poetry. Discussions of issues such as technical, theoretical, formal, and historical developments. Topics and readings vary. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 303 or ENGL 316 or ENGL 355; and senior standing or above; or consent of the instructor.

438
Topics in Performance Studies 3 OR 4 hours.
 In-depth study of a topic, movement, artist, or author in the field of drama and performance studies, broadly defined. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 304 or ENGL 313 or ENGL 341 or ENGL 342 or ENGL 370 or ENGL 375; and senior standing or above; or consent of the instructor.

439
Topics in Fiction and Theories of Fiction 3 OR 4 hours.
 Study of fiction related to a particular theory of fiction (realism, romance, literary naturalism, narrative theory, fictional poetics). Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 305; and senior standing or above; or consent of the instructor.

440
Topics in Cultural and Media Studies 3 OR 4 hours.
 Study of a medium, genre, theme, period, influence, or problem in culture and cultural theory. Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 302 or ENGL 341 or ENGL 342; and senior standing or above; or consent of the instructor.

441
Topics in Asian American Literature and Culture 3 OR 4 hours.
 An advanced seminar that examines various forms of cultural production by Asian American artists of diverse ethnic backgrounds. Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 327 or ENGL 328 or ENGL 359; and senior standing or above; or consent of the instructor.

443
Topics in Gender, Sexuality, and Literature 3 OR 4 hours.
 Specific study of topics in gender and literature. Content varies. Same as GWS 443. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 361 or ENGL 362 or ENGL 363 or GWS 101 or GWS 102; and senior standing or above; or consent of the instructor.

444
Topics in Theories of Gender and Sexuality 3 OR 4 hours.
 Advanced study of topics related to theories of gender and sexuality. Same as GWS 444. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 361 or ENGL 362 or ENGL 363 or GWS 101 or GWS 102; and senior standing or above; or consent of the instructor.

445
Topics in Disability Studies 3 OR 4 hours.
 This course will focus on topics structured around particular aspects of disability studies and its practical, cultural, and theoretical implications. Same as DHD 445. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 361 or ENGL 362 or ENGL 363 or ENGL 364; and senior standing or above; or consent of the instructor.

446
Topics in Criticism and Theory 3 OR 4 hours.
 Focus on a particular critical or theoretical topic, movement, tradition, or figure. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 361 or ENGL 362 or ENGL 370 or ENGL 372; and senior standing or above; or consent of the instructor.

448
Topics in Rhetorical Studies 3 OR 4 hours.
 Study of theoretical intersections between rhetoric and cultural studies to describe and explain the ways in which discourse constructs identity, knowledge, and values. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Prerequisite(s): ENGL 374 or ENGL 375 or ENGL 342 or ENGL 402; and senior standing or above; or consent of the instructor.

459
Introduction to the Teaching of English in Middle and Secondary Schools 3 OR 4 hours.
 Intended as a general initiation to the field of secondary English teaching, the course focuses on many of the crucial issues facing teachers in contemporary language arts classrooms. 3 undergraduate hours. 4 graduate hours. Fieldwork required. Prerequisite(s): Completion of the English Composition require-



ment; and sophomore standing or above.

469

Women's Literary Traditions 3 OR 4 hours.

An exploration of issues such as the female aesthetic, women's popular literature, factors that enable creativity, and differences of race and class. **Same as** GWS 469. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ENGL 361 or ENGL 362 or ENGL 363; and senior standing or above; or consent of instructor.

470

Topics in Multiethnic Literatures in the United States 3 OR 4 hours.

Topics in the literatures of American racial and ethnic groups. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** ENGL 328 or ENGL 333 or ENGL 350 or ENGL 351 or ENGL 355 or ENGL 357; or ENGL 359; and senior standing or above; or consent of the instructor.

471

Topics in Native American Literatures 3 OR 4 hours.

The history and development of literature by and about American Indians. Content varies. **Same as** NAST 471. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** Senior standing or above and 6 hours of English, African-American studies, or Latin American studies or consent of the instructor.

472

Women and Film 3 OR 4 hours.

Roles and representations of women in classical Hollywood, European art, and independent feminist cinemas. **Same as** AH 434 and GWS 472. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ENGL 302 or ENGL 342 or ENGL 361 or ENGL 362 or ENGL 363; and senior standing or above; or consent of instructor.

473

Topics in African-American Literature 3 OR 4 hours.

African-American literature and culture for students with significant background in the field. Topics vary. **Same as** AAST 490. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): AAST 357 or AAST 360 or ENGL 357; and sen-

ior standing or above; or consent of the instructor.

474

Topics in Popular Culture and Literature 3 OR 4 hours.

Study of a specific topic relating literature to popular culture, such as sport, television, and best-sellers. Critical analysis of the cultural mythology encasing these subjects. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): ENGL 302 or ENGL 341 or ENGL 342; and senior standing or above; or consent of the instructor.

478

The Bible as Literature 3 OR 4 hours.

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. **Same as** JST 478 and RELS 478. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in ENGL 240; and grade of C or better in ENGL 241 or grade of C or better in ENGL 242 or grade of C or better in ENGL 243; or consent of the instructor.

480

Reading Black Women Writing 3 OR 4 hours.

Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. **Same as** AAST 470 and GWS 470. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** AAST 350 or AAST 351 or AAST 355 or AAST 357 or AAST 360; or ENGL 350 or ENGL 351 or ENGL 355 or ENGL 361 or ENGL 363; or consent of the instructor.

481

Methods of Teaching English in Middle and Secondary Schools 3 OR 4 hours.

Theory and practice; emphasis on current approaches to language and literature. 3 undergraduate hours. 4 graduate hours. All students in the teacher education program must take this course in the term preceding their student teaching. **Prerequisite(s):** Senior standing or 9 hours of English or consent of the instructor.

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(s): Senior standing or 9 hours of English and consent of the instructor. Students must obtain override from the Writing Center.

483

Studies in Language and Rhetoric 3 OR 4 hours.

Study of a particular topic or movement in language or rhetoric. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): Senior standing or above; or consent of the instructor.

484

Studies in Language and Cognition 3 OR 4 hours.

Examination of relationships among theories of language structure, cognition, and discourse, with applications of such theories to the writing process. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ENGL 401; or consent of the instructor.

485

Studies in the English Language and Linguistics 3 OR 4 hours.

Study of a topic such as language diversity and literacy, theories of grammar, literacy in society, or ethnicity and language. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** Senior standing or 9 hours of English or consent of the instructor.

486

The Teaching of Writing in Middle and Secondary Schools 3 OR 4 hours.

Rhetoric and composition pedagogy. Study of a topic. Content varies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Senior standing or 9 hours of English or consent of the instructor.

489

The Teaching of Reading and Literature in Middle and Secondary Schools 3 OR 4 hours.

Intended as a part of the English education methods sequence, with particular emphasis on helping prospective teachers assist struggling readers in the study of litera-

ture. 3 undergraduate hours. 4 graduate hours. Fieldwork required. **Prerequisite(s):** ENGL 459; and composition of the English Composition requirement; or consent of the instructor.

490

Advanced Writing of Poetry 3 OR 4 hours.

Advanced work on poetic techniques and practices; emphasis on analysis of student work, using published examples; particular attention to individual student development. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time by undergraduates. **Prerequisite(s):** Undergraduates: Grade of B or better in ENGL 210. Registration restrictions: Graduate students must obtain approval of the Department of English.

491

Advanced Writing of Fiction 3 OR 4 hours.

Advanced practice; emphasis on analysis of student work and published examples. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time by undergraduates. **Prerequisite(s):** Undergraduates: Grade of B or better in ENGL 212. Registration restrictions: Graduate students must obtain approval of the Department of English.

492

Advanced Writing of Nonfiction Prose 3 OR 4 hours.

Advanced practice in writing essays, articles, reviews, or other forms of nonfiction prose. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time by undergraduates.

Prerequisite(s):

Undergraduates: Grade of B or better in ENGL 201. Registration restrictions: Graduate students must obtain approval of the Department of English.

493

Internship in Nonfiction Writing 3 hours.

Individual projects in approved professional setting to practice writing skills at an advanced level. May be repeated up to 1 time. A maximum of 3 hours may be applied toward either the undergraduate major in English or a graduate degree in English. Credit is not given for ENGL 493 if the student has credit in ENGL 593.

Prerequisite(s): ENGL 201 and 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 for the application process.

494
Topics in the Teaching of English 1 TO 4 hours.

Study of a topic in literature, composition, and/or pedagogy. The content varies with each offering. May be repeated to a maximum of 8 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

495
Playwriting 3 OR 4 hours.

The development of scripts for stage performance. **Same as** THTR 423. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Junior standing or above; and approval of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.

498
Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Satisfactory/Unsatisfactory grading only. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

499
Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Satisfactory/Unsatisfactory grading only. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in ENGL 498, and approval of the department.

500
Master's Proseminar 4 hours.

Study of disciplinary foundations of research in literary criticism, broadly defined.

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
Proseminar I: Theory and Practice of Criticism 4 hours.

Forms and theories of criticism, analysis of their application to specific genres and works, and practice in writing criticism. The first semester of the two-part required PhD proseminar.

504
Proseminar II: Seminar in Critical Studies 4 hours.

More focused attention on the themes presented in Proseminar I. Students will complete major research projects based on bibliographies compiled in Proseminar I.

505
Seminar in Old English 4 hours.

A topic in Old English, emphasis on literature or philology. Content varies.

507
Theory, Rhetoric, and Aesthetics 4 hours.

Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, or periods in theory, rhetoric, or aesthetics.

510
Seminar in Language and Rhetoric 4 hours.

Study of a topic or movement in linguistic or rhetorical theory. Content varies. May be repeated to a maximum of 12 hours.

Prerequisite(s): ENGL 401 or ENGL 402 or consent of the instructor.

515
Seminar in Medieval Studies 4 hours.

The works of Chaucer and other Middle English writers. Content varies. May be repeated to a maximum of 12 hours.

Prerequisite(s): A minimum of 3 hours in Middle English literature.

517
British Literature and Culture 4 hours.

Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, or periods in British literature and culture.

518
Newberry Library Seminar in Renaissance Literature 4 hours.

Late medieval and Renaissance literature. In conjunction with the Newberry Library Center for Renaissance Studies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** ENGL 503 and 3 hours of medieval or Renaissance literature.

520
Seminar in Renaissance Studies 4 hours.

English literature and culture of the sixteenth and seventeenth centuries. Topic varies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** One course in Renaissance literature.

525
Seminar in Restoration and Eighteenth-Century Studies 4 hours.

Content varies. Restoration and 18th-century studies by topic. May be repeated to a maximum of 12 hours. **Prerequisite(s):** One course in Restoration or 18th-century literature.

527
American Literature and Culture 4 hours.

Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, or periods in American literature and culture.

530
Seminar in British Romantic Studies 4 hours.

Advanced study of author(s), topic, movement, or genre. Content varies. May be repeated to a maximum of 12 hours.

Prerequisite(s): A course in Romantic literature.

535
Seminar in Victorian Studies 4 hours.

Focus on author, topic, movement, or genre. Content varies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** 3 hours Victorian literature or consent of the instructor.

537
Global and Multiethnic Literatures and Cultures 4 hours.

Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, or periods in global and/or multiethnic literatures and cultures.

540
Seminar in Modern and/or Contemporary Studies in English 4 hours.

Study of an author, topic, movement, or genre. Content varies. As part of the Discourse, Text, and Context series, provides seminar-level instruction in a key field of Modern or contemporary English studies. Topic varies by instructor. May be repeated to a maximum of 12 hours.

Prerequisite(s): A minimum of three hours in modern literature.

545
Seminar in American Studies to 1865 4 hours.

As part of the Discourse, Text, and Context series, provides seminar-level instruction in a key field in American studies to 1865. May be repeated to a maximum of 12 hours.

Prerequisite(s): One advanced course in American literature.

547
Media, Film, and Performance Studies 4 hours.

Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, or periods in media, film, and/or performance studies.

550
Seminar in American Studies after 1865 4 hours.

Seminar topic in American studies, possibly including mixed media, after 1865. May be repeated to a maximum of 12 hours.

552
Research Practicum in Language and Cognition 4 hours.

Research design and methods examining theories of the development of literacy and relationships among learner, text, and context. May be repeated to a maximum of 12 hours. **Prerequisite(s):** ENGL 484.

553
Research Practicum in Discourse Analysis 4 hours.

Discourse analysis addresses issues of intentional communication, inference, the structure of texts or talk-in-interaction, and the interactive construction of social actions or identities in discourse. **Same as** LING 553. May be repeated to a maximum of 12 hours.

554
Seminar in English Education 4 hours.

Critical examination of theory and practice in the teaching of English. Content varies.



555
Teaching
College Writing 4 hours.
 Methods, materials, and practice in teaching college writing. Satisfactory/Unsatisfactory grading only.

556
Teaching Creative Writing 4 hours.
 Methods, materials, and practice in teaching creative writing. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Admission to the Program for Writers or consent of the instructor.

557
Language and Literacy 4 hours.
 Emphasizing breadth of knowledge in a field of inquiry involving genres, authors, topics, periods, or issues in language and literacy, broadly conceived.

560
Practicum in the Teaching of English 1 TO 4 hours.
 Provides an opportunity for supervised discussion and evaluation of materials and methods used in undergraduate English instruction. Participation in appropriate departmental workshops. For English department teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated. No graduation credit. **Prerequisite(s):** Students may enroll only during terms in which they hold a teaching assistantship in the English department.

567
Discourse Analysis 4 hours.
 Emphasizing breadth of knowledge in a field of inquiry involving discourse.

570
Program for Writers: Poetry Workshop 4 hours.
 Emphasis on poems written by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the Program for Writers.

571
Program for Writers: Fiction Workshop 4 hours.
 Emphasis on fiction written by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the program for writers.

572
Program for Writers: Novel Workshop 4 hours.
 Emphasis on novels written by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the Program for Writers.

573
Program for Writers: Translation Workshop 4 hours.
 Emphasis on translations by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the Program for Writers or consent of the instructor.

574
Program for Writers: Nonfiction Workshop 4 hours.
 Emphasis on nonfiction written by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the Program for Writers.

575
Program for Writers: Experimental Writing Workshop 4 hours.
 Emphasis on experimentation by students. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Admission to the Program for Writers.

576
Program for Writers: Editing and Publishing 4 hours.
 Practicum in basic procedures for students desiring careers in publishing, or who wish to understand the stages of production from proposal to publication. **Prerequisite(s):** Consent of the instructor.

579
The Past Decade 4 hours.
 Discussion of the past decade of critical work in any given field within literary, rhetorical, linguistic, or cultural studies.

580
Seminar in Genres of Literature, Film, and Media 4 hours.
 A single genre, such as the Gothic novel, or mode, such as poetry, fiction, or drama. May be repeated to a maximum of 12 hours.

581
Seminar in Interdisciplinary English Studies 4 hours.
 Relation between literature and such fields as fine arts, philosophy, psychology, religion, science, sociology, and politics. Content

varies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** 4 hours in area of literature to be studied.

582
Seminar in Multiethnic and Transatlantic Cultures 4 hours.
 Study of a genre, movement, topic, or author in American multiethnic and/or transatlantic culture. Content varies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Minimum of 3 hours in Native American literature.

583
Seminar in Theories of the Popular 4 hours.
 Study of a theme, form, era, or methodological approach. Content varies. May be repeated to a maximum of 12 hours.

584
Seminar in Visual Technologies 4 hours.
 One topic or movement. Content varies. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Minimum of 3 hours in film.

585
Seminar in Theoretical Sites 4 hours.
 One author, topic, or movement in advanced theory. Topic varies by instructor. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Theory course at the undergraduate or graduate level.

586
Seminar in Discourse, Culture, Mind 4 hours.
 Interdisciplinary readings relating language and cognition from writing, rhetoric, cognitive psychology, and linguistics on a particular topic. May be repeated to a maximum of 12 hours. **Prerequisite(s):** ENGL 484.

588
Seminar in Great Cities/Global Cultures 4 hours.
 One author, topic, or movement in text, culture, and public space. May be repeated to a maximum of 12 hours.

591
Prospectus Preparation 1 TO 4 hours.
 Students who have passed their preliminary exams may enroll in this independent study with their primary adviser the semester after they have successfully completed their exams. Satisfactory/Unsatisfactory grading only. May be repeated.

592
Preliminary Examination Research 1 TO 8 hours.
 Supervised research and reading in preparation for the preliminary examinations. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Consent of the instructor and consent of the director of graduate studies.

593
Graduate Internship in Nonfiction Writing 1 TO 4 hours.
 Directed field experience in an approved professional setting to practice writing, editing, and research skills at an advanced level. May be repeated. A maximum of four hours of credit may be applied toward a graduate degree in English. Credit is not given for ENGL 593 if the student has credit for ENGL 493. **Prerequisite(s):** Consent of the English department internship coordinator. Resume and writing samples are required.

596
Independent Study 1 TO 4 hours.
 Independent study and research in literature, creative writing, or language, literacy, and rhetoric. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and consent of the director of graduate studies.

597
Master's Project Research in English 1 TO 4 hours.
 Supervised research and reading that facilitates the student in preparation of the project research. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. No more than 4 hours of ENGL 597 may be applied toward the degree. **Prerequisite(s):** Consent of the instructor and consent of the director of graduate studies. Open only to master's degree students.

599
Thesis Research 0 TO 16 hours.
 For students involved in dissertation research and writing. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of instructor and the director of graduate studies.





English as a Second Language (ESL)

401

Teaching Methods for International Teaching

Assistants 1 TO 3 hours. Basic communication and presentation skills for international teaching assistants. The culture of the American college classroom. Satisfactory/Unsatisfactory grading only. No graduation credit.

Prerequisite(s): Score of 150 on the Test of Spoken English (TSE or Speak test) and consent of the instructor.

Entrepreneurship (ENTR)

430

Family Business Management 3 hours.

Competitive strengths/weaknesses of a family business; dynamics of family interactions within the overlapping family; management and ownership systems. Credit is not given for ENTR 430 if the student has credit for MGMT 430.

Recommended background: Prior experience in a family business.

454

Introduction to Entrepreneurship 3 hours.

Awareness and realistic understanding of the new venture formation process; role of the entrepreneur in the economy and society; self-evaluation; venture feasibility. Credit is not given for ENTR 454 if the student has credit for MGMT 455 or MKTG 454.

Prerequisite(s): FIN 300 and MGMT 340 and MKTG 360, or consent of the instructor.

464

Entrepreneurial Consulting 3 hours.

Student teams diagnose and recommend solutions to problems and opportunities facing Chicago-area entrepreneurs and smaller enterprises. Application of previous coursework. Credit is not given for ENTR 464 if the student has credit for MKTG 464. **Prerequisite(s):** ENTR 454; and ECON 218 or ECON 220, and 6 credit hours of other entrepreneurship courses.

494

Special Topics in Entrepreneurship 3 hours.

Exploration of areas not covered in existing course offerings or study of selected topics in greater depth. Subject will vary from semester to semester. May be repeated to a maximum of 6 hours. May be

repeated if topics vary.

Prerequisite(s): ENTR 454 and senior standing or above and approval of the department.

499

Independent Study in

Entrepreneurship 1 TO 3 hours. Independent study of an approved topic in entrepreneurship. Student must prepare a written report under the guidance of the instructor. **Prerequisite(s):** Approval of the department.

502

Entrepreneurship 4 hours. 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. Credit is not given for ENTR 502 if the student has credit for MBA 510 or MGMT 502 or MKTG 502. **Prerequisite(s):** ACTG 500 and MKTG 500 or the equivalent courses.

555

Entrepreneurship: New Venture Formation 4 hours.

Awareness and understanding of new venture creation and/or acquisition by developing a plan for a business; assessment of personal entrepreneurial potential. Credit is not given for ENTR 555 if the student has credit for MGMT 555 or MKTG 555.

Prerequisite(s): ENTR 502 or consent of the instructor.

558

Entrepreneurial Electronic Commerce 4 hours.

The role of electronic commerce in entrepreneurship; competitive practices, marketing strategies, financing options, creating an e-commerce business plan. Credit is not given for ENTR 558 if the student has credit in MGMT 558 or MKTG 558. **Prerequisite(s):** ACTG 500 or MBA 501; and MKTG 500 or MBA 506.

559

Entrepreneurial Consulting 4 hours.

Application of principles from management and marketing to entrepreneurial firms. Emphasis on consulting with young and small firms and developing a consulting practice. Assessment, problem solving, and change facilitation. Credit is not given for ENTR 559 if the student has credit for MGMT 559 or MKTG 559. Fieldwork required. **Prerequisite(s):** ENTR 502.

594

Special Topics in Entrepreneurship 4 hours.

Exploration of areas not covered in existing course offerings or study of selected topics in greater depth. Subject will vary from semester to semester. **Prerequisite(s):** ENTR 502 and approval of the department.

596

Independent Study in

Entrepreneurship 1 TO 4 hours. Independent study of an approved topic in entrepreneurship. Student must prepare a written report under the guidance of the instructor. **Prerequisite(s):** Approval of the department.

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(s):** Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate students admitted by consent as space permits. To obtain consent, see the SPH registrar.

405

Environmental Calculations 2 hours.

Problem solving techniques as applied to environmental and occupational health: dimensional analysis, mass and energy balances, trial and error solutions, numerical and graphical techniques. **Recommended background:** Mathematics through calculus, college physics and chemistry.

408

Biological, Chemical, Explosives, and Nuclear Weapons as Public Health Threats 3 hours.

Preparation, understanding of threats, and rescue and response issues pertaining to potential terrorist incidents from a public health perspective. **Same as** EPID 408. **Prerequisite(s):** Graduate or professional standing; or consent of the instructor.

Recommended background: EOHS 400 and EPID 410.

411

Water Quality Management 4 hours.

Water pollution; historical and current developments in problems and solutions; characterization of pollutants, regulatory framework, risk assessment, standards, modeling, water purification, public health concerns.

Prerequisite(s): Taught online. Consent of the instructor.

418

Analysis of Water and Wastewater Quality 2 hours.

Basic instrumentation and procedures related to measurement and surveillance of various water quality parameters.

421

Fundamentals of Industrial Hygiene 2 hours.

Recognition, evaluation, and control of chemical, biological, and physical agents in the workplace. Application to preliminary surveys, measurement of exposure, and evaluation of control measures.

Prerequisite(s): 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(s):** 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.

Prerequisite(s): EOHS 400 and EOHS 405 and EOHS 421, or consent of the instructor.

431

Air Quality Management I 3 hours.

Sources, control, dispersion, and effects upon receptors of air pollution: health and other adverse effects, meteorology and dispersion estimation, photochemistry, aerosol characterization. **Same as** CME 419. **Prerequisite(s):** EOHS 405 or CME 216 or consent of 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(s):** EOHS 405 or consent of the instructor.

440
Chemistry for Environmental Professionals 3 hours.
Introductory atmospheric chemistry, aspects of air pollution, chemistry related to natural water and water treatment; priority organic pollutants and heavy metals. **Same as** CME 411.
Prerequisite(s): One year of college chemistry.

450
Principles of Occupational and Environmental Medicine 2 hours.
Causes, transmission, control, and prevention of the physical/chemical environmental stressors in the work environment; industrial processes and hazards, contrasts between developed and developing countries.

455
Environmental and Occupational Toxicology 3 hours.
General and applied toxicology as it relates to environmental and occupational exposures to hazardous agents. Emphasis on basic principles, specific types of toxicity, and major classes of toxic agents. **Prerequisite(s):** CHEM 232 and CHEM 234 and BIOS 100 or the equivalent courses and senior standing or above 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(s):** EOHS 400 or consent of the instructor.

472
Management of Solid and Hazardous Wastes 3 hours.
Management of solid and hazardous waste, including radioactive waste, landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regula-

tions, siting, health impacts.

Same as CME 423 and GEOG 444.

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(s):** 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.
Water and wastewater characterization: physical, chemical, and biological methods of water and wastewater treatment; regulatory and control trends; and environmental impact determinations. **Prerequisite(s):** 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, and temperature. **Prerequisite(s):** EOHS 405 and EOHS 421 and EOHS 428, or consent of the instructor.

529
Industrial Hygiene Laboratory II 2 hours.
Fieldwork: comprehensive industrial hygiene surveys of local work places. Health hazard analysis, design of sampling strategies, collection of field data, report preparation. **Prerequisite(s):** EOHS 428 and EOHS 438; or consent of the instructor.

532
Air Quality Management II 2 hours.
Air quality management: Integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. **Same as** CME 526. **Prerequisite(s):** EOHS 431 or CME 419.

542
Water Chemistry 4 hours.
Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. **Same as** CME 524. **Prerequisite(s):** EOHS 440 or CME 411.

543
Environmental Organic Chemistry 4 hours.
Properties and behavior of environmental organic pollutants. Theory and estimation techniques. Concepts of environmental fate assessment. Applications of fate models. **Same as** CME 523. **Prerequisite(s):** EOHS 440 or CME 411.

551
Occupational Diseases 4 hours.
Diseases caused by physical, chemical, and biological agents in the workplace: toxicology, epidemiology, pathophysiology, diagnosis, treatment, prevention, high risk populations, early detection.

554
Occupational and Environmental Epidemiology 2 hours.
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. **Same as** EPID 554. **Prerequisite(s):** EPID 401 and BSTT 401 and EOHS 400; or consent of the instructor.

555
Advanced Topics in Toxicology 3 hours.
An in-depth consideration of bio-transformation, toxicokinetic modeling, biomarkers, and chemical carcinogenesis. The course is based on articles from the primary literature. Molecular through physiological level effects are considered. **Prerequisite(s):** Grade of B or better in EOHS 455; or consent of the instructor.

556
Risk Assessment in Environmental and Occupational Health 3 hours.
Methodologies for utilizing toxicological and epidemiological data to estimate health risks due to exposures to pollutants in environments. **Prerequisite(s):** EOHS 405 and BSTT 401 and EPID 400; or consent of the instructor.

557
Design and Analysis of Experiments 4 hours.
Detailed consideration of the mathematical, statistical, and

practical aspects of design and analysis of experiments that are encountered in physicochemical, biological, and engineering investigations. Extensive computer use required. **Prerequisite(s):** Completion of one course in statistics, working knowledge of at least one statistical software package (SAS, Design Expert, Minitab, etc.), and consent of the instructor. **Recommended background:** A working knowledge of linear algebra and additional advanced course work in statistics.

558
Industrial Toxicology 2 hours.
Clinical toxicology and mechanisms of workplace toxicants: metals, fibers, dusts, and organics. Diagnosis and treatment. **Prerequisite(s):** EOHS 400 and EOHS 457.

564
Geographic Information System Application in Public Health 3 hours.
Examination of GIS applications in public health and the process of designing a GIS-based public health investigation. **Same as** HPA 564. This is an online course. **Prerequisite(s):** BSTT 400 and HPA 465 and consent of the instructor.

565
Datamining Applications in Public Health 3 hours.
Presents the key public health information system sources, describes the process of datamining, and introduces the student to a sample of datamining techniques. **Same as** HPA 565. Extensive computer use required. **Prerequisite(s):** BSTT 400.

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. **Prerequisite(s):** EOHS 405 and EOHS 421 and EOHS 428; or consent of instructor.

572
Environmental Risk Assessment and Management 4 hours.
Risk assessment from a public health, quantitative, and environmental risk management perspective.



584

Radiation Protection 3 hours.

Radioactivity, energetics, kinetics, interactions, external protection, dosimetry, recommendations and standards, measurement, radon.

Prerequisite(s): 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(s):** 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(s):** Consent of the instructor.

Epidemiology (EPID)

400

Principles of Epidemiology 3 hours.

Introduction to descriptive and analytic epidemiology, determinants of health and disease in populations, and application of epidemiologic methods to disease control; includes use of basic epidemiologic software. **Prerequisite(s):** Credit or concurrent registration in BSTT 400 or consent of the instructor. Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate 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.

Prerequisite(s): 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.

Prerequisite(s): EPID 401 and credit or concurrent registration in BSTT 401; or consent of the instructor.

403

Introduction to Epidemiology: Principles and Methods 3 hours.

Introduction to descriptive and analytic epidemiology, and determinants of health and disease in populations. Measures of occurrence, association, and statistical testing will be addressed, along with study designs, bias, and confounding. **Prerequisite(s):** Credit or concurrent registration in BSTT 400 and graduate or professional standing; or consent of the instructor.

404

Intermediate Epidemiologic Methods 4 hours.

Introduction to multivariable methods in epidemiology, including stratified analysis and regression modeling. Students will use statistical software to analyze data from epidemiologic studies.

Prerequisite(s): EPID 403 and EPID 406; and credit or concurrent registration in BSTT 401; and graduate or professional standing; or consent of the instructor.

405

Human Growth and Nutrition 3 hours.

Worldwide variation in human growth and the factors that contribute to differences between populations and individuals in the timing and pattern of growth and development. **Same as** ANTH 405.

406

Epidemiologic Computing 3 hours.

Hands-on course for students using SAS and other computer tools for epidemiologic analysis. Addresses theoretical and practical issues in statistical programming for epidemiology students.

Prerequisite(s): BSTT 400 and EPID 400; or BSTT 400 and EPID 403; or consent of the instructor.

408

Biological, Chemical, Explosives, and Nuclear Weapons as Public Health Threats 3 hours.

Preparation, understanding of threats, and rescue and response issues pertaining to potential terrorist incidents from a public health perspective.

Same as EOHS 408.

Prerequisite(s): Graduate or professional standing; or consent of the instructor. **Recommended background:** EOHS 400 and EPID 410.

409

The Epidemiology of HIV/AIDS 2 hours.

Review of the HIV/AIDS pandemic and the global response to it, focusing on patterns of transmission, risk factors, and prevention/intervention. **Prerequisite(s):** EPID 400 or consent of the instructor.

410

Epidemiology of Infectious Diseases 2 hours.

Epidemiology of selected infectious diseases, including incidence, prevalence, and control of disease. Epidemic investigation is emphasized. **Prerequisite(s):** Credit or concurrent registration in EPID 400; or credit or concurrent registration in EPID 403.

411

Epidemiology of Chronic Diseases 3 hours.

Selected topics in chronic diseases with critical analysis of current epidemiologic literature.

Prerequisite(s): 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(s):** EPID 400 or consent of instructor.

426

Pharmacoepidemiology 2 hours.

Reviews processes of ethical drug development. Epi methodologies for drug evaluation are presented, giving students opportunity to critically appraise efficacy and safety of clinical data. Course complements BSTT 430.

Prerequisite(s): EPID 400 or consent of the instructor.

428

Epidemiology of Violence 2 hours.

Reviews public health aspects of violence-related mortality and morbidity; examines existing databases and conceptual frameworks focusing on etiology, epidemiology, surveillance, and prevention.

Prerequisite(s): EPID 400 or consent of the instructor.

471

Population 3 OR 4 hours.

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.

Same as SOC 471. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): 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 substantive areas of epidemiology (including infectious disease, chronic disease, environmental/occupational, social). Course content will vary with each offering. May be repeated. Students may register in more than one section per term.

Prerequisite(s): EPID 400 or EPID 403 or consent of instructor; and graduate or professional standing.

501

Advanced Quantitative Methods in Epidemiology 3 hours.

Advanced quantitative methods used in the analysis of case-control and cohort studies, including computer applications.

Prerequisite(s): 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(s): EPID 410 or consent of instructor.

513

Epidemiology of Aging 2 hours.

Current methodologic and public health issues in the epidemiology of aging will be explored.

Prerequisite(s): EPID 401 or EPID 411; and consent of the instructor.

515

Cancer Epidemiology 3 hours.

Critical review of topics and issues relevant to cancer epidemiology to promote synthesis of current knowledge and awareness of research issues.

Prerequisite(s): EPID 401 and EPID 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. **Prerequisite(s):** EPID 501 and EPID 515; or consent of the instructor. **Recommended background:** EPID 520.

**517
Epidemiology of
Cardiovascular
Diseases 2 hours.**

Epidemiology and risk factors of cardiovascular diseases. **Prerequisite(s):** EPID 411 or consent of instructor.

**518
The Epidemiology of
Pediatric Diseases 3 hours.**

Familiarizes the student with issues unique to research on children. Lecture topics include epidemiology of childhood diseases, important research studies, and methodologic problems specific to studying children.

Prerequisite(s): EPID 401 and BSTT 400; or consent of instructor.

**519
Research Protocol
and Grant
Development 1 hour.**

A review of funding options and examples of developing fundable research proposals. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** EPID 400.

**520
Genetics in
Epidemiology 2 hours.**

Topics in genetic/molecular epidemiology, including genetics, population genetics, molecular biology, and molecular genetics. Familiarizes students with laboratory/statistical concepts and applications in epidemiological studies. **Prerequisite(s):** EPID 401 or consent of the instructor.

**545
Reproductive and
Perinatal Health 3 hours.**

Focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. **Same as** CHSC 545. **Prerequisite(s):** BSTT 400; and EPID 400 and EPID 403; or consent of the instructor.

**548
Readings in
Reproductive and
Perinatal
Epidemiology 2 hours.**

Advanced seminar in reproductive/perinatal epidemiology with particular emphasis on methodologic issues. **Same as** CHSC 548. **Prerequisite(s):** CHSC 441 and EPID 404 or consent of the instructor. **Recommended background:** Maternal and child health and epidemiology.

**549
Advanced
Applied Methods in
MCH Epidemiology 3 hours.**

Gives conceptual and technical understanding of statistical and epidemiological methods, builds skills/proficiency in applying these. Attention is given to data handling tasks and to statistical/epidemiologic strategies for analysis and presentation. **Same as** CHSC 549. **Prerequisite(s):** EPID 402 or EPID 404; and BSTT 401 and EPID 406; or consent of the instructor. **Recommended background:** Credit or concurrent registration in EPID 501.

**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. **Same as** EOHS 554. **Prerequisite(s):** EPID 401 and BSTT 401 and EOHS 400; or consent of the instructor.

**591
Current Epidemiologic
Literature 2 hours.**

Student presentation of recently published scientific papers of epidemiologic interest to promote breadth of knowledge and critical examination of evidence. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): EPID 401 or EPID 403 or consent of instructor.

**594
Advanced Special
Topics in
Epidemiology 1 TO 4 hours.**

Advanced special topics in substantive areas of epidemiology (including infectious disease, chronic disease, environmental/occupational, social, methods, etc). Course content will vary with each offering. May be repeated. Students may register in more than one section per term.

Prerequisite(s): EPID 401 or EPID 403 or consent of instructor.

**595
Epidemiology Research
Seminar 1 hour.**

Current developments in theory and application of biostatistics and epidemiology with presentations by faculty and visiting scientists. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Credit or concurrent registration in EPID 400 or EPID 403 or consent of the instructor.

Finance (FIN)

**412
Portfolio
Management 3 hours.**

Development of portfolio theory; establishment of portfolio objectives for individuals, corporations, banks, pension, and mutual funds; evaluation of portfolio performance. **Prerequisite(s):** FIN 310.

**415
Fixed Income
Securities 3 hours.**

Valuation of fixed income securities, term structure estimation, and arbitrage trading with practical application using real data. **Prerequisite(s):** 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 which determine futures and options prices. **Prerequisite(s):** FIN 310.

**430
Introduction to
Money and Banking 3 hours.**

Payment and banking systems; credit and market risk management; the Federal Reserve System; globalization of monetary, banking, and regulatory systems. **Prerequisite(s):** FIN 300.

**431
Theory and Structure of
Financial Markets 3 hours.**

The distribution of saving and credit over time and risk categories. The financial services industry. Administration and regulation of global money, security, and derivatives markets. **Prerequisite(s):** 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.

Prerequisite(s): FIN 300 and FIN 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(s):** FIN 300.

**465
Property and Liability
Insurance 3 OR 4 hours.**

Using property and liability insurance to manage risk. Topics may include fire, marine, consequential loss, crime, title, automobile, and workers' compensation insurance. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** FIN 300; or consent of the instructor.

**466
Life and Health
Insurance 3 OR 4 hours.**

Types, uses, and evaluation of life and health insurance. Economics of the industry. Regulation and taxation. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** FIN 300; or consent of the instructor.

**472
Real Estate
Finance 3 OR 4 hours.**

Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. **Same as** ECON 472. 3 undergraduate hours. 4 graduate hours. May not be used to satisfy the economics credit requirement for the MA in Economics and PhD in Economics. Elective credit only will be applied toward these degrees.

Prerequisite(s): ECON 218 or ECON 220.

**473
Introduction to Risk
Management 3 hours.**

Introduction to risk management. Loan and credit management; credit scoring. Risk measurements and reserves; banking and insurance capital requirements, the BASEL accord, tail events, and catastrophic event insurance. Financial contracts and hedging. **Same as** IDS 473.

Prerequisite(s): FIN 300 and IDS 371.





494
Special Topics in Finance 1 TO 4 hours.
An intensive study of a selected topic in finance. Topics vary by sections and by term. 1 to 3 undergraduate hours. 2 to 4 graduate hours. May be repeated if topics vary. Students may register for more than one section per term. May be repeated to a maximum of 6 hours for undergraduates; may be repeated to a maximum of 8 hours for graduate students. **Prerequisite(s):** Consent of the instructor.

495
Competitive Strategy 4 hours.
Multidisciplinary analysis of organization strategy and policy using case method and/or business simulation. Assignments involve extensive library research as well as oral and written reports. **Prerequisite(s):** Senior standing in the College of Business Administration and completion of all other CBA core courses, or consent of the instructor.

500
Introduction to Corporate Finance 4 hours.
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. **Prerequisite(s):** ACTG 500 and credit or concurrent registration in ECON 520 and admission to the MBA program, the MA in Real Estate program, the Master of Health Administration program, or approval of the director of graduate studies.

510
Investments 4 hours.
Theory and practice of investment analysis. Topics included are the institutional organization of security markets, and fundamental principles of asset valuation with application to specific securities. **Prerequisite(s):** FIN 500.

512
Portfolio Analysis 4 hours.
Development of portfolio theory; establishment of portfolio objectives; evaluation of portfolio performance; investment objectives for individuals, corporations banks, pension and mutual funds, and their interrelation with economic environment. **Prerequisite(s):** 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 portfolio managers of domestic and multinational organizations. Analysis of factors which determine futures and options prices. **Prerequisite(s):** 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(s):** FIN 500.

530
Money and Banking 4 hours.
The functions of money; monetary standards; development and operation of commercial banking and the Federal Reserve System. Theories of the supply and demand for money; effects of monetary changes on economic activity, interest rates, and income. **Prerequisite(s):** FIN 500.

531
Capital Markets 4 hours.
Capital markets in the private economy. Flow of funds in financial markets and financial intermediaries. Pricing of securities. Short-term money markets and the Federal Reserve System. Market for long-term securities. Financial markets and the stability and progress of the economy. **Prerequisite(s):** 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(s):** 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(s):** 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(s):** Consent of the instructor.

571
Empirical Issues in Finance 4 hours.
The methodology used in analyses of market efficiency, asset pricing, and capital allocation. **Prerequisite(s):** FIN 500 and consent of the instructor.

573
Risk Management 4 hours.
Introduction to risk management. Risk measurements and reserves, banking and insurance capital requirements, the BASEL accord, tail events, catastrophic event insurance, reinsurance. Financial contracts and hedging. **Same as** IDS 573. **Prerequisite(s):** Credit or concurrent registration in IDS 570 and FIN 500.

594
Special Topics in Finance 1 TO 4 hours.
An intensive study of a selected topic in finance. Topics vary by sections and by term. May be repeated to a maximum of 12 hours if topics vary. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596
Independent Study in Finance 1 TO 4 hours.
Independent study under the direction of a faculty member. Must be arranged before the start of the semester. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of department head or instructor.

599
PhD Thesis Research 0 TO 16 hours.
Independent research on topic approved for doctoral dissertation under supervision of faculty adviser. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

French (FR)

401
Reading French for Graduate Students 4 hours.
Grammar, vocabulary, general and specialized reading practice; for graduate students wishing to fulfill French reading requirements for the PhD. Credit may not be applied toward a graduate degree. Taught in English.

Prerequisite(s): Graduate standing and consent of the instructor. **Recommended background:** Some prior experience with elementary French.

413
French Feminist and Gender Theory 3 OR 4 hours.
An introduction to French theories of gender, including feminisms influenced by Lacanian psychoanalysis, political philosophy, and multicultural studies. **Same as** GWS 413. 3 undergraduate hours. 4 graduate hours. May be used for credit in the French major only with consent of the director of undergraduate studies. Taught in English. Students who intend to use French 413 toward the major in French must complete assignments in French. **Prerequisite(s):** FR 301 or FR 302; or consent of the instructor.

415
French Literature of the Middle Ages 3 OR 4 hours.
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. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** FR 301 or consent of the instructor.

416
Topics in Sixteenth-Century French Literature 3 OR 4 hours.
Intensive analysis of Renaissance literature (Rabelais, Montaigne, Marguerite de Navarre, poetry of the Pleiade, etc.) in the cultural context of Humanism and the Reformation. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** FR 301 or consent of the instructor.

417
Topics in
Seventeenth-Century
French
Literature 3 OR 4 hours.
 Intensive study of Baroque and Classicism, with focus on major genres: theater (Corneille, Moliere, Racine); poetry (La Fontaine); prose (Pascal, de Sevigne); novel (de Lafayette). 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. Students may register in more than one section per term.
Prerequisite(s): FR 301 or consent of the instructor.

418
Topics in
Eighteenth-Century
French
Literature 3 OR 4 hours.
 Introduction to the literature and philosophy of the Enlightenment through representative authors (Rousseau, Diderot, etc.) and major genres (novel, essay, conte, theatre, etc.). 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times.
Prerequisite(s): FR 301 or consent of the instructor.

419
Topics in
Nineteenth-Century
French
Literature 3 OR 4 hours.
 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. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times.
Prerequisite(s): FR 301 or consent of the instructor.

420
Topics in
Twentieth-Century
French
Literature 3 OR 4 hours.
 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. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** FR 301 or consent of the instructor.

422
Francophone
Novel 3 OR 4 hours.
 Intensive analysis of a topic in Francophone literature. Scope includes Quebec, Africa, the Antilles, and French novelists outside of France. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times.

Prerequisite(s): FR 301 or consent of the instructor.

433
Advanced Oral
and Written
French 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): FR 334 or consent of the instructor.

440
Topics in French
and Francophone
Cinema 3 OR 4 hours.
 This course will examine a selection of French and Francophone films chosen around a period, theme, or genre. Topics will vary. 3 undergraduate hours. 4 graduate hour. May be used for credit in the French major only with consent of the director of undergraduate studies. Taught in English. Students who intend to use French 440 toward the major in French must complete assignments in French. **Prerequisite(s):** FR 301 or FR 302; or consent of the instructor.

448
Foundations of
Second Language
Teaching 3 OR 4 hours.
 Provides an introduction to second language acquisition research and its implications for communicative language teaching. Emphasis is on creating activities to develop high school students' communicative abilities in speaking and listening. **Same as** GER 448 and SPAN 448. 3 undergraduate hours. 4 graduate hours. Taught in English.
Prerequisite(s): Junior standing or above; and consent of the instructor and three courses at the 200- and 300-levels.

449
Teaching Second
Language Literacy
and Cultural
Awareness 3 OR 4 hours.
 Examines the nature of literacy as a reciprocal relationship between readers, writers, texts, and culture. Students learn the practical and theoretical foundations of classroom teaching of second language reading and writing skills. **Same as** GER 449 and SPAN 449. 3 undergraduate hours. 4 graduate hours. Taught in English.
Prerequisite(s): Junior standing or above; and consent of the instructor.

461
French Civilization I:
Medieval and
Renaissance 3 OR 4 hours.
 Interdisciplinary approach to French civilization of the Middle Ages and the Renaissance, including history, literature, the beaux-arts, and philosophy. 3 undergraduate hours. 4 graduate hours. Lectures and discussion in French. **Prerequisite(s):** FR 302 or consent of the instructor.

462
French Civilization II:
Seventeenth and
Eighteenth
Centuries 3 OR 4 hours.
 Interdisciplinary approach to French civilization of the seventeenth and eighteenth centuries, including history, literature, the beaux-arts, and philosophy. 3 undergraduate hours. 4 graduate hours. Lectures and discussion in French. **Prerequisite(s):** FR 302 or consent of the instructor.

463
French Civilization III:
Nineteenth and
Twentieth
Centuries 3 OR 4 hours.
 An interdisciplinary approach to French civilization of the nineteenth and twentieth centuries, including history, literature, beaux-arts, and philosophy. 3 undergraduate hours. 4 graduate hours. Lectures and discussion in French. **Prerequisite(s):** FR 302 or consent of the instructor.

464
Topics in French
Civilization 3 OR 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. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** FR 302 or consent of the instructor.

470
Educational Practice
with Seminar I 6 hours.
 The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.
Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

471
Educational Practice
with Seminar II 6 hours.
 The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.
Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in FR 470, and approval of the department.

494
Special Topics 3 OR 4 hours.
 Topics will vary from term to term and may cover such areas as literary theory or culture. **Same as** SPAN 494 and ITAL 494. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. Taught in English.
Prerequisite(s): Junior standing or above; and approval of the department.

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.
Prerequisite(s): French major with senior or graduate standing and consent of the department.

502
Theoretical and
Research Foundations
of Communicative
Language Teaching 4 hours.
 Introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice. **Same as** SPAN 502. Credit is not given for FR 502/SPAN 502 if the student has credit for SPAN 450 or FR 450 or GER 407. Taught in English.
Prerequisite(s): Appointment as a teaching assistant. For students outside the department: consent of the instructor.

510
Seminar in Literary
Studies 4 hours.
 Topics vary. May be repeated. Beyond 12 hours of credit earned, consent of the director of graduate studies required.



560
Seminar in Cultural Studies 4 hours.
Topics vary. May be repeated to a maximum of 12 hours.

570
Seminar in Literary Theory and Criticism 4 hours.
Theories of literary production and reception; their application to the practice of literary criticism. Specific themes and topics vary. **Same as** SPAN 570. May be repeated to a maximum of 8 hours with approval. Approval to repeat course granted by the instructor. Taught in English.

575
French Abroad 0 TO 16 hours.
Lectures, seminars, and practical work in francophone literature and civilization in France. May be repeated to a maximum of 33 hours. **Prerequisite(s):** Approval 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. **Prerequisite(s):** Graduate standing in French and approval of the department.

598
Thesis Research 0 TO 16 hours.
Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Approval of the director of graduate studies.

Gender and Women's Studies (GWS)

403
Culture and Sexuality: Cultural History of Same-Sex Relations 3 OR 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. **Same as** HIST 403. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or consent of the instructor.

412
Women and the Environment 3 OR 4 hours.
Women's place in the built environment; the role of gender in environmental experience including women as users, designers,

planners, policy makers, and critics. **Same as** ARCH 412. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Advanced undergraduate or graduate standing, or consent of the instructor.

413
French Feminist and Gender Theory 3 OR 4 hours.
An introduction to French theories of gender, including feminisms influenced by Lacanian psychoanalysis, political philosophy, and multicultural studies. **Same as** FR 413. 3 undergraduate hours. 4 graduate hours. May be used for credit in the French major only with consent of the director of undergraduate studies. Taught in English. Students who intend to use French 413 toward the major in French must complete assignments in French. **Prerequisite(s):** FR 301 or FR 302; or consent of the instructor.

419
Public Health Aspects of Sexuality and Women's Health 3 hours.
An overview of human sexuality from a public health view with special emphasis on family planning, sexuality, and behavior effects on women's health. **Same as** CHSC 419. **Prerequisite(s):** Graduate standing; or junior standing or above with consent of the instructor.

424
Gender, Crime, and Justice 3 OR 4 hours.
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. **Same as** CRJ 424. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101 and CRJ 220; or consent of the instructor.

425
Sociology of Gender 3 OR 4 hours.
Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family, economy. **Same as** SOC 424. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology or gender and women's studies courses or consent of the instructor.

439
Gender and Cultural Production 3 OR 4 hours.
Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. **Same as** GER 439. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time if topics vary. Taught in English. Students who intend to use GER 439/GWS 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: Literature/Culture. **Prerequisite(s):** GER 212 or consent of the instructor.

441
Introduction to Maternal and Child Health 3 hours.
Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. **Same as** CHSC 441. **Prerequisite(s):** Consent of the instructor. **Recommended background:** Some knowledge of maternal and child health issues.

443
Topics in Gender, Sexuality, and Literature 3 OR 4 hours.
Specific study of topics in gender and literature. Content varies. **Same as** ENGL 443. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** ENGL 361 or ENGL 362 or ENGL 363 or GWS 101 or GWS 102; and senior standing or above; or consent of the instructor.

444
Topics in Theories of Gender and Sexuality 3 OR 4 hours.
Advanced study of topics related to theories of gender and sexuality. **Same as** ENGL 444. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** ENGL 361 or ENGL 362 or ENGL 363 or GWS 101 or GWS 102; and senior standing or above; or consent of the instructor.

450
Women and Mental Health Nursing 3 hours.
Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving

women's mental health. **Same as** NUJC 450 and NUJW 450. **Prerequisite(s):** 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 or GWS 315.

469
Women's Literary Traditions 3 OR 4 hours.
An exploration of issues such as the female aesthetic, women's popular literature, factors that enable creativity, and differences of race and class. **Same as** ENGL 469. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ENGL 361 or ENGL 362 or ENGL 363; and senior standing or above; or consent of instructor.

470
Reading Black Women Writing 3 OR 4 hours.
Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth- and twentieth-century black women writers. **Same as** AAST 470 and ENGL 480. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** AAST 350 or AAST 351 or AAST 355 or AAST 357 or AAST 360; or ENGL 350 or ENGL 351 or ENGL 355 or ENGL 361 or ENGL 363; or consent of the instructor.

472
Women and Film 3 OR 4 hours.
Roles and representations of women in classical Hollywood, European art, and independent feminist cinemas. **Same as** AH 434 and ENGL 472. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ENGL 302 or ENGL 342 or ENGL 361 or ENGL 362 or ENGL 363; and senior standing or above; or consent of instructor.

478
Women in Chinese History 3 OR 4 hours.
Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution, and the historiography of the field. **Same as** ASST 478 and HIST 478. 3 undergraduate hours. 4 graduate hours. **Recommended background:** Previous course work in Chinese history or women's studies.

484
Topics in the History of Women 3 OR 4 hours.
Specific topics are announced each term. **Same as** HIST 484. 3 under-



graduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or gender and women's studies or consent of the instructor.

485 Gender and Politics 3 OR 4 hours.

Impact of gender on basic categories of Western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. **Same as** POLS 485. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): POLS 190 and one 200-level course in political theory, or consent of the instructor.

490 Advanced Topics in the Study of Sexuality 3 OR 4 hours.

Special study at an advanced level of a topic concerning sexuality. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of gender and women's studies, or consent of the instructor.

494 Advanced Topics in Gender and Women's Studies 3 OR 4 hours.

Specialized study of a problem, topic, or issue relevant to the interdisciplinary area of gender and women's studies at the advanced level. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Senior or graduate standing.

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 Perspectives 4 hours.

Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. **Same as** ANTH 514. **Prerequisite(s):** ANTH 500 or consent of the instructor.

515 Psychology of Women and Gender 3 hours.

Critical examination of psychological theories and research on women and gender, including biological, psychoanalytic, socialization, power, and social constructionist perspectives.

Same as PSCH 515. **Prerequisite(s):** Graduate standing in psychology; or PSCH 315 or GWS 315, and consent of the instructor.

525 Social Work with Women 3 hours.

Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. **Same as** SOCW 525.

Prerequisite(s): SOCW 410; or consent of the instructor.

540 Language and Gender 4 hours.

Examination of sociolinguistic research and theories on the interrelationships between language and gender, including gender categories in linguistic systems, gender differences in language use, interaction, and cross-cultural comparisons. **Same as** LING 540.

547 Race, Class, and Gender Dimensions of Crime and Justice 4 hours.

Theories addressing the intersections of race, class, gender, crime, and justice. Specifically, students examine criminological theories, social construction of race, class, and gender, legal decision making, and implications of this for justice in our society. **Same as** CRJ 547.

583 Women in Education 4 hours.

An overview of girl's and women's educational experiences and placement within the academic structure (as students, professionals, and intellectuals). The impact of gender on the realization of educational, economic, and social opportunities. **Same as** PS 583. **Prerequisite(s):** Consent of the instructor or enrollment in the PhD in Policy Studies in Urban Education program.

594 Special Topics in Gender and Women's Studies 1 TO 4 hours.

Study of a problem, topic, or issue relevant to the interdisciplinary area of gender and women's studies. Content varies. May be

repeated to a maximum of 12 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor or one course in gender and women's studies.

596 Independent Study 1 TO 4 hours.

Topics and plan of study must be approved by the instructor. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

Geography (GEOG)

401 Topics in Regional Geography 3 OR 4 hours.

Geographic analysis of cultural and environmental systems of a political, economic, or climatic region of the world as defined by the instructor. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 6 hours. **Prerequisite(s):** One upper-division course in each of the areas of skills, systematic and regional/urban geography.

418 Ethnographic and Qualitative Research Methods 3 OR 4 hours.

Practical introduction to the techniques of social scientists for research in natural social settings: participant observation/nonparticipant observation, interviewing, use of documentary sources, etc.

Same as ANTH 418. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Junior standing or above.

425 Field Techniques in Archaeology 4 hours.

Exposure to field methods in archaeology through participation in an actual research project. Students are instructed in field excavation techniques. Usually offered in summer session. **Same as** ANTH 425. May be repeated to a maximum of 8 hours.

Prerequisite(s): ANTH 102 or consent of the instructor.

Recommended: Concurrent registration in ANTH 426 or GEOG 426.

426 Laboratory Techniques in Archaeology 4 hours.

Exposes students to laboratory methods in archaeology through the analysis of excavated materials. Students are instructed in laboratory techniques. **Same as** ANTH 426. May be repeated to a

maximum of 8 hours.

Prerequisite(s): ANTH 102 or consent of the instructor.

Recommended: Concurrent registration in ANTH 425 or GEOG 425.

429 Archaeological Methods 3 OR 4 hours.

This course will familiarize students with various methodologies used by archaeologists and geoarchaeologists. Course will concentrate on a different method each time it is taught. **Same as** ANTH 429. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. Students may register for more than one section per term.

431 Advanced Landform Geography 3 OR 4 hours.

Genesis of surficial landforms and processes that sculpt them. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 131 or GEOL 101 or consent of the instructor.

432 Geomorphology and Archaeology 3 OR 4 hours.

Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geoarchaeology. **Same as** ANTH 421. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 131 or EAES 101 or consent of the instructor.

441 Topics in Resource Management and Policy 3 OR 4 hours.

Selected topics dealing with environmental problems at local, regional, or global levels. Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 6 hours.

Prerequisite(s): GEOG 341 or GEOG 361 or consent of the instructor.

442 Environmental Hazards and Risks 3 OR 4 hours.

Environmental risks of natural and technological hazards; causes and consequences to people; social theories of risks; coping mechanisms used to reduce risk. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 251 or GEOG 441 or consent of the instructor.



444 Management of Solid and Hazardous Wastes 3 hours.

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.

Same as CME 423 and EOHS 472.

453 Seminar in Cultural Ecology 3 OR 4 hours.

Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture.

Same as ANTH 453. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 101 or GEOG 151 or consent of the instructor.

455 Quantitative Methods 3 OR 4 hours.

Introductory statistics course in statistical methods for anthropological problem solving. Primary emphasis is on univariate and bivariate statistics, such as means standard deviations, correlation, chi square, t-tests, and simple regressions. **Same as** ANTH 455. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

461 Location and Land Use 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 361 or consent of the instructor.

464 Geographic Modeling of Transportation Systems 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 100 and GEOG 161.

470 Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

471 Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in GEOG 470, and approval of the department.

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(s): GEOG 276 or GEOG 278 or consent of the instructor.

477 Remote Sensing of the Environment 4 hours.

Principles and practices of processing and interpretation of remotely sensed imagery including aerial photographs, radar, and multispectral satellite images. Hands-on use of image-processing software.

Same as ANTH 477. Extensive computer use required.

478 Mapping with Microcomputers 4 hours.

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. **Same as** ANTH 484. **Prerequisite(s):** GEOG 475 or consent of the instructor.

481 Geographic Information Systems I 4 hours.

Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files.

Geocoding. **Same as** ANTH 481. **Prerequisite(s):** GEOG 100 and one from GEOG 278, GEOG 386, IDS 100; or consent of the instructor.

482 Geographic Information Systems II 4 hours.

Application of raster- (or grid-) based geographic information systems to the spatial analysis of landscapes. **Same as** ANTH 482.

483 Geographic Information Systems III 4 hours.

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.

Same as ANTH 483.

Prerequisite(s): GEOG 482 or ANTH 482 or consent of the instructor.

484 Qualitative Methods in Geographic Research 3 OR 4 hours.

Use of qualitative methods in geographic research. Research design choices, data collection and analysis, and writing. Applications in environmental and urban geography. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** GEOG 481 or Geography major or minor or consent of instructor.

485 Computer Cartography 4 hours.

The fundamentals of cartography and cartographic design. The use of state-of-the-art, Windows-based computer mapping software for querying and displaying cartographic data contained in GIS databases. **Same as** ANTH 485.

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(s):** GEOG 482 or consent of the instructor.

491 History and Philosophy of Geography 3 OR 4 hours.

The philosophy of geography, its theory and research techniques. Analysis of bibliographic sources; criticism of papers on assigned topics. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Declared major or minor in Geography; or consent of the instructor.

496 Internship 1 TO 4 hours.

Professional field experience with an agency or organization in the private or public sector on projects related to the student's area of specialization. **Same as** ANTH 496. May be repeated to a maximum of 8 hours. Only 4 hours of credit may be applied toward the Minor in Geography.

Prerequisite(s): Declared major in Anthropology, minor in Geography, or full graduate standing in Anthropology or Geography and consent of the faculty adviser, head of the department, or the director of internship programs.

505 Seminar on the Geography of Colonialism and Neocolonialism 3 hours.

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. May be repeated to a maximum of 6 hours. **Prerequisite(s):** GEOG 353 or GEOG 401 or consent of the instructor.

510 Seminar in Social Organization 4 hours.

Theoretical and substantive issues about how societies are organized. **Same as** ANTH 510. May be repeated to a maximum of 12 hours.

511 Topics in Urban Geography 3 hours.

Critical analysis of selected theories, methods, and problems of urban and settlement geography. May be repeated to a maximum of 9 hours. **Prerequisite(s):** One 400-level course in urban, economic, or transportation geography.

530 Seminar in Physical Geography 3 hours.

General topic to be defined by instructor; specific approved topic to be defined, researched, and discussed by student. May be





repeated to a maximum of 6 hours. **Prerequisite(s):** GEOG 421 or GEOG 431 or consent of the instructor.

541 Seminar on Resource Management and Policy 3 hours.

Social policy issues in the resolution of resource management conflicts. Topics will vary. May be repeated to a maximum of 6 hours. **Prerequisite(s):** GEOG 441 or GEOG 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 macrospatial behavior. **Prerequisite(s):** Consent of the instructor.

575 Seminar in Cartography 3 hours.

Review of recent developments in computer mapping and identification of mapping needs. Research on conceptual and program solutions to computer mapping problems. May be repeated to a maximum of 6 hours.

Prerequisite(s): GEOG 475 and GEOG 481; or consent of the instructor.

589 Geographic Information Systems for Planning 4 hours.

Applications of Geographic Information Systems to urban planning and policy making.

Same as UPP 508.

Prerequisite(s): 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(s):** GEOG 595.

595 Departmental Seminar 3 hours.

Review of contemporary geographic theory in academic research and professional practice. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Graduate standing in Geography.

596 Independent Study 1 TO 4 hours.

Independent research on approved topic not related to thesis preparation. May be repeated to a maximum of 6 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of faculty adviser and the instructor.

598 Master's Thesis Research 0 TO 16 hours.

Independent research on a topic approved for a graduate thesis. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 16 hours. **Prerequisite(s):** Consent of the thesis research adviser.

Germanic Studies (GER)

400 German for Reading Knowledge 3 OR 4 hours.

Preparation for the Graduate Proficiency Exam. Basic components of German grammar, sentence structure, and vocabulary. Selected texts in humanities, social sciences, and natural sciences. 3 undergraduate hours. 4 graduate hours. Credit may not be applied toward a degree or minor offered by the Department of Germanic Studies. Does not satisfy the graduation requirement in foreign languages.

401 Advanced Practice in German Language Skills 3 OR 4 hours.

Communicative use of German techniques for understanding written and spoken texts, practicing conversation, and writing texts such as essays, compositions, letters, and e-mail. 3 undergraduate hours. 4 graduate hours. May be repeated.

Only majors and minors outside the Department of Germanic Studies may repeat this course for a maximum of 6 hours of credit. Area: language. **Prerequisite(s):** GER 212 or the equivalent.

Recommended background: Credit or concurrent registration in GER 310.

404 Yiddish for Reading Knowledge 3 OR 4 hours.

Preparation for the Graduate Proficiency Exam. Basic components of Yiddish grammar, sentence structure, and vocabulary. Selected texts in the original language will be studied. 3 undergraduate hours. 4 graduate hours. Does not satisfy the graduation requirement in foreign

languages. **Prerequisite(s):** GER 211; or consent of the instructor or graduate standing.

407 Theoretical and Research Foundations of Communicative Language Teaching 3 OR 4 hours.

Focuses on theory and practice of communicative language teaching and explores current approaches of task-based instruction, testing, and media-enhanced instruction. 3 undergraduate hours. 4 graduate hours. Taught in English. Pedagogical examples are in German. Ten hours of high school observation required. Area: language. **Prerequisite(s):** GER 212 or the equivalent.

408 Introduction to Translation Theory 3 OR 4 hours.

The study of translation theory and its application to translating German texts of various types into English. Appropriate for students who want to become translators. 3 undergraduate hours. 4 graduate hours. Area: language. **Prerequisite(s):** GER 212 or the equivalent, or graduate standing.

411 The City as Cultural Focus 3 OR 4 hours.

Interdisciplinary study of urban culture with focus on German-speaking countries. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. Taught in English. No knowledge of German required. Students who intend to use GER 411 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. **Prerequisite(s):** For majors and minors in the Department of Germanic Studies only: GER 212 or the equivalent or consent of the instructor.

420 Germanic Cultural Studies I: Genres 3 OR 4 hours.

Concentration on a genre, with stress on cultural analysis and theoretical inquiry. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times if topics vary. Students who intend to use GER 420 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. **Prerequisite(s):** GER 212 or consent of the instructor.

421 Germanic Cultural Studies II: Authors, Movements, Periods 3 OR 4 hours.

Critical analysis of texts in the biographical, social, cultural, and historical context. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times if topics vary. Students who intend to use GER 421 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. **Prerequisite(s):** GER 212 or consent of the instructor.

422 Germanic Cultural Studies III: Themes 3 OR 4 hours.

Explores themes in German-speaking societies, such as the family, xenophobia, crime, and science, with stress on literary analysis and interpretation. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times if topics vary. Students who intend to use GER 422 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. **Prerequisite(s):** GER 212 or consent of the instructor.

430 Classical German Philosophy 3 OR 4 hours.

Introduction to German philosophy and intellectual history through the critical analysis of major authors and texts. 3 undergraduate hours. 4 graduate hours. Area: literature/culture. **Prerequisite(s):** One 300-level course in Germanic Studies or consent of the instructor.

437 Contemporary Germanic Literature 3 OR 4 hours.

Literature of the German-speaking world since World War II, with emphasis on current issues and recent critical approaches to literature. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time if topics vary. Area: literature/culture. **Prerequisite(s):** GER 211 or the equivalent, or graduate standing or consent of the instructor.

438 The Faust Legend 3 OR 4 hours.

Discusses Goethe's *Faust* within the context of European and non-European literatures. Traces the origins, significance, and interpretation of the *Faust* figure. 3 undergraduate hours. 4 graduate hours. Area: literature/culture. **Prerequisite(s):** GER 212 or the equivalent or graduate standing or consent of the instructor.

439
Gender and Cultural Production 3 OR 4 hours.
Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. **Same as** GWS 439. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time if topics vary. Taught in English. Students who intend to use GER 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. **Prerequisite(s):** GER 212 or consent of the instructor.

448
Foundations of Second Language Teaching 3 OR 4 hours.
Provides an introduction to second language acquisition research and its implications for communicative language teaching. Emphasis is on creating activities to develop high school students' communicative abilities in speaking and listening. **Same as** FR 448 and SPAN 448. 3 undergraduate hours. 4 graduate hours. Taught in English. **Prerequisite(s):** Junior standing or above; and consent of the instructor and three courses at the 200- and 300-levels.

449
Teaching Second Language Literacy and Cultural Awareness 3 OR 4 hours.
Examines the nature of literacy as a reciprocal relationship between readers, writers, texts, and culture. Students learn the practical and theoretical foundations of classroom teaching of second language reading and writing skills. **Same as** FR 449 and SPAN 449. 3 undergraduate hours. 4 graduate hours. Taught in English. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

450
Business Operations in German-Speaking Countries 3 OR 4 hours.
The political, cultural, historical, and economic environment in which business operates in the German-speaking countries; the effects of this environment on international business. 3 undergraduate hours. 4 graduate hours. Knowledge of German not required.

461
German Abroad 0 TO 17 hours.
Taken in a German-speaking country. Lectures, seminars, and practical work in German language, literature, and civilization. May be repeated to a maximum of 34 hours. **Prerequisite(s):** GER 104 or the equivalent, a 2.75 overall grade point average, a 3.00 grade point average in Germanic Studies, and approval of the department.

470
Exploring the Field of Germanic Studies 3 OR 4 hours.
Team-taught. Research in film studies, gender studies, Jewish culture, minorities, literary studies, intellectual history, applied linguistics in Germanic Studies. Each unit taught by a different faculty member from Department of Germanic Studies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Undergraduate students must obtain approval of the department.

480
Hegel Studies 3 OR 4 hours.
Studies in the philosophy of Hegel, including principal texts (e.g., Phenomenology), or problems (e.g., critique of metaphysics), or comparative studies (e.g., Hegel's critique of Kant). 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. Taught in English. Area: literature/culture. **Prerequisite(s):** GER 430 or consent of the instructor. **Recommended background:** PHIL 224 or PHIL 425.

492
Internship in International Business 0 TO 12 hours.
Student placement in an international organization or firm in a German-speaking country or its U.S. subsidiary or division. Satisfactory/Unsatisfactory grading only. May be repeated with approval. Approval to repeat course granted by the department. **Prerequisite(s):** GER 211 and consent of the instructor and a GPA of 2.00. **Recommended background:** Concurrent registration in GER 493 or registration in GER 493 in the semester immediately following.

493
Internship Seminar: Business 1 TO 4 hours.
Academic component of the internship experience. Studies in the field of the internship and further investigation of related topics. May be repeated with approval. Approval to repeat course granted by the department. A maximum of 3 hours of

credit may be applied toward an undergraduate degree offered by the Department of Germanic Studies, and a maximum of 4 hours of credit may be applied toward a graduate degree offered by the Department of Germanic Studies. **Prerequisite(s):** GER 211 and credit or concurrent registration in GER 492 and consent of the instructor and a grade point average of 2.00.

494
Educational Practice with Seminar I 6 hours.
The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

495
Educational Practice with Seminar II 6 hours.
The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit, or concurrent registration in GER 494, and approval of the department.

513
Germanic Culture from the Enlightenment to the 1848 Revolution 4 hours.
Representative works and authors studied in a cultural context. May be repeated if topics vary.

514
Germanic Culture from the Industrial Revolution to the Present 4 hours.
Representative works and authors are studied in a cultural context. May be repeated if topics vary.

515
Film and Media Culture 4 hours.
Explores the theory and history of film and other visual media. Emphasis will be given to the status of media texts in their cultural contexts, as well as to their function as components of modern social institutions. Taught in English. Students will be asked to watch films outside of class.

531
Seminar in Special Topics 4 hours.
In-depth study of a theme, genre, or other element in Germanic literature and culture not confined to a single historical period. Topics vary. May be repeated to a maximum of 12 hours if topics vary.

572
The Role of Reading in Second Language Acquisition 4 hours.
Analyzes current theoretical and research directions in text comprehension processes as well as reading as a source of input for second language acquisition. Taught in English.

593
Internship Seminar: Academic Training 4 hours.
Training in instruction of literature and culture courses at the college level. Students will be involved in a faculty-taught culture/literature course. Restricted to graduate students in Germanic studies.

596
Independent Study for Graduate Students 1 TO 4 hours.
Independent study in the field of Germanic studies. **Prerequisite(s):** Consent of the instructor.

598
Master's Thesis Research 0 TO 16 hours.
Independent research under faculty supervision on a topic approved by the Graduate Program Committee. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of supervising faculty member and committee approval.

599
PhD Thesis Research 0 TO 16 hours.
Independent research for the PhD. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Approval of the department and consent of the instructor.



Graduate College (GC)

401

Scientific Integrity and Responsible Research 0 hours.

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. Satisfactory/Unsatisfactory grading 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.

Prerequisite(s): Graduate standing.

470

Essentials for Animal Research 1 hour.

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. Satisfactory/Unsatisfactory grading only.

471

Experimental Animal Techniques 2 hours.

Noninvasive and invasive techniques commonly used in laboratory animals are performed with emphasis placed upon the proper use of anesthetic, analgesics, and aseptic techniques. Satisfactory/Unsatisfactory grading only. Animals used in instruction.

Prerequisite(s): GC 470.

473

Seminar in Comparative Medicine 1 TO 2 hours.

Selected fields of interest and research in comparative medicine will be presented in the areas of comparative biology, model development, and experimental techniques. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** GC 471 or consent of the instructor.

491

Graduate Study Abroad 0 TO 16 hours.

Lectures, seminars, and independent travel/study abroad in conjunction with an approved graduate program. May be repeated to a maximum of 32 hours.

Prerequisite(s): Graduate standing and approval of the Graduate College.

495

Graduate Summer Interdisciplinary Seminars 3 hours.

These summer seminars provide unique opportunities for students and faculty to explore new and interdisciplinary fields of inquiry in intense periods of mutual inquiry outside the regular curriculum. Topics vary. May be repeated. Students must check with program director to apply credit toward degree. **Prerequisite(s):** Graduate standing and consent of the instructor.

Graduate College—Life Sciences (GCLS)

501

Biochemistry 3 hours.

Fundamental properties of biomacromolecules, the thermodynamics underlying basic biochemical processes and the properties of enzymes, including the kinetics of operation, and regulation, illustrated with important examples. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

502

Molecular Biology 3 hours.

Core molecular biology course covering basic principles of gene expression, genome replication, and molecular interactions important to biological processes in prokaryotes and eukaryotes. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

503

Cell Biology and Integrative Physiology 4 hours.

Advanced course on fundamental aspects of cell biology; basic concepts will be integrated with key examples of human physiology which span gene, protein, cell, tissue, organ, and whole body function. Credit is not given for GCLS 503 if the student has credit in BCHE 561 or ANAT 585 or MIM 585 or PHYB 585. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

504

Research Methods I 1 TO 2 hours.

Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological, and biophysical methodology such as separation techniques and studies of biomembranes. May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

505

Research Methods II 1 TO 3 hours.

Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological, and biophysical methodology such as bioimaging and biochemical analysis. May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

506

GEMS Research Rotation 2 TO 5 hours.

Research rotation course in which first-year students from the GEMS program will undertake research projects in laboratories affiliated with this program. Satisfactory/Unsatisfactory grading only. May be repeated. Animals used in instruction. **Prerequisite(s):** Open only to PhD degree students.

510

Integrative Biology 3 hours.

Advanced-level, intensive course addressing fundamental topics of developmental biology, immunology, and cancer biology, with concentration on thematic issues that integrate these subjects.

Prerequisite(s): GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

511

Molecular Genetics 3 hours.

Core molecular genetics course covering classical and molecular principles of microbial and Mendelian genetics. Systems covered include bacteria, bacteriophage, animal viruses, yeast, *Drosophila*, mouse, and human. **Prerequisite(s):** GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

515

Receptor Pharmacology and Cell Signaling 3 hours.

Advanced course on cell-surface and nuclear receptors and mechanisms of signaling through receptors. Provides an overview of receptor theory, hands-on data analysis, and lectures and discussions on various signaling mechanisms. Credit is not given for GCLS 515 if the student has credit in PCOL 505 or PHYB 505.

Prerequisite(s): GCLS 501 or approval of the department. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

594

Special Topics in Life Sciences 1 TO 4 hours.

Systematic study of advanced selected topics in life sciences from an interdisciplinary approach. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor

Health Policy and Administration (HPA)

400

Principles of Management in Public Health 3 hours.

A detailed discussion of the conceptual and theoretical foundations to the principles of management, with an emphasis on public health and healthcare settings.

Prerequisite(s): Enrollment restricted to public health students; other graduate, professional, and advanced undergraduate students admitted by consent as space permits. To obtain consent, see the SPH registrar.





402
Social Ethics and Public Health 3 hours.

Application of ideas from philosophy, law, political science, and economics to analyze the ethical basis of public health policies and programs.

403
U.S. Healthcare System 3 hours.

Overview of the U.S. healthcare system, including its evolution, utilization patterns, providers—human, institutional, and organizational—financing, regulating, evaluating, and reforming.

405
Leadership in Public Health Practice 3 hours.

Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. **Same as** CHSC 405.

Prerequisite(s): CHSC 400 and consent of the instructor.

410
Health Organizational Leadership 3 hours.

Examines the roles, responsibilities, and impact of leaders of organizations in the health industry. Critical structures and techniques of effective organizational leaders are taught.

417
Quality Management in Health Services 3 hours.

Surveys development of quality management, theoretical basics, and diverse perspectives of quality management and regulation. Presents relevant research and management methodologies.

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 healthcare.

Prerequisite(s): 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."

434
Law and the Healthcare System 3 hours.

Survey of legal topics important to the management of healthcare organizations, including relationships among the parties involved in the delivery of healthcare and the law of business organizations.

Prerequisite(s): Graduate or professional standing and approval of the department.

437
Healthcare Data 3 hours.

Review of data types in a healthcare information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems. **Same as** BHIS 437. Taught online only. A UIC netid is required.

Prerequisite(s): Graduate standing and consent of the instructor.

441
Strategic Management of Healthcare Organizations 4 hours.

Introduction to strategic competitive analysis for healthcare organizations. Topics include healthcare competition, entrepreneurship, technology and innovation, multi-constituent environment, and human resources.

Prerequisite(s): Graduate or professional standing and approval of the department.

444
Healthcare 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.

451
Healthcare Finance 3 hours.

Examines practical aspects of finance in healthcare and recent developments in financial management of healthcare organizations, and applications of financial management techniques to specific problems facing healthcare managers.

Prerequisite(s): Graduate or professional standing and approval of the department.

460
Introduction to the Economics of Health and Healthcare 2 hours.

Introduces principles of economic analysis, with examples from public health and medical care. Examines how consumers and companies decide what to buy or sell, why markets determine a product's price, and when public intervention improves welfare.

463
Managerial Health Economics 3 hours.

Uses managerial economics to study healthcare system: demand for medical services; role of health insurance; productivity/cost measurement; labor markets and competition. **Prerequisite(s):** HPA 400 or consent of the instructor.

465
Health Information and Decision Support Systems 4 hours.

Introduction to computer-assisted management information and decision systems in health organizations: analysis and design of databases; data and information flow; reports; and uses microcomputers. This is an online course.

494
Introductory Special Topics in Health Policy and Administration 1 TO 4 hours.

Introductory topics in health administration, policy analysis, healthcare financing, cost-effectiveness evaluation. Topics vary by semesters.

495
MHA Preceptorship 1 TO 3 hours.

Preceptor-guided field experience in health administration designed to promote critical thinking and problem solving skills, and application of management knowledge and skills in a practice setting. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours.

496
MHA Capstone 2 hours.

Individual, integrative product in health administration designed to demonstrate student's mastery of health administration concepts and skills, including information access, synthesis, and use in critical thinking. **Prerequisite(s):** Graduate or professional standing and approval of the department.

510
Healthcare Information Systems 4 hours.

Examination, through case studies, group and class discussions, and problem-based learning, of the effective utilization of information technology applications currently in place and on the horizon in healthcare organizations. **Same as** BHIS 510. Taught online only. A UIC netid is required.

Prerequisite(s): Graduate standing and consent of the instructor.

511
Organization Theory Applied to Health Programs 3 hours.

Classical and modern organization theories applied to health programs. Includes organization structure and goals, management functions and processes, and managerial controls and evaluation. **Prerequisite(s):** HPA 400 or consent of the instructor.

512
Ethics in Clinical Research 1 hour.

Survey of key ethical issues involved in conducting research with human subjects, including informed consent, confidentiality, access and equity. **Same as** MHPE 512. Extensive computer use required. Requires completion of an online course in human subjects research, to be supplemented by classroom discussion of the topics raised in that course and others.

Prerequisite(s): Approval of the department. Students must be enrolled in the Master of Science in Public Health program.

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. **Prerequisite(s):** HPA 400 and consent of the instructor.

520
Management of Healthcare Communication Systems 4 hours.

Examination and management of data communications in and between healthcare facilities including examination of issues, standards, technologies, and system configurations. **Same as** BHIS 515. Taught online only. A UIC netid is required.

Prerequisite(s): HPA 510 or BHIS 510; and graduate standing and consent of the instructor.

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(s):** BSTT 401 and HPA 400 or consent of the the instructor.

525
Management of Population Health Risks 3 hours.
Examines the roles that healthcare delivery organizations can play, and methodologies used, in developing programs specific to the needs of the community they serve. **Prerequisite(s):** HPA 403 and HPA 410 and HPA 495.

527
Critical Issues in Long-Term Care Policy 3 hours.
Long-term care organization, financing, delivery utilization and policy, emphasizing affordability, access and quality in a managed care environment. **Same as** CHSC 527. **Prerequisite(s):** CHSC 400 and CHSC 425; or consent of the instructor.

531
Health Information Systems Analysis and Design 4 hours.
A project course applying systems analysis and design theory to healthcare systems evaluation, modeling, and implementation. **Same as** BHIS 520. Taught online only. A UIC netid is required. **Prerequisite(s):** HPA 510 or BHIS 510; and graduate standing and consent of the instructor.

534
Research Design and Grant Writing 2 hours.
Introduction to the skills necessary to plan a research project and write a research grant proposal using a systematic approach. **Same as** MHPE 534. Previously listed as MHPE 431. **Prerequisite(s):** Graduate or professional standing; and approval of the department.

535
Translating Research into Practice 3 hours.
Current theory and practical reality related to the adoption and use of new scientific findings in patient care. The influence of research on public policy. **Same as** MHPE 535. Extensive computer use required. **Prerequisite(s):** Graduate or professional standing; and approval of the department.

540
Social and Organizational Issues in Health Informatics 4 hours.
Examines the impact of information systems on the healthcare organization and applies theory through case study analysis. **Same as** BHIS 525. Taught online only. A UIC netid is required. **Prerequisite(s):** BHIS 510 or HPA 510; and BHIS 515 or BHIS 520 or BHIS 530 or HPA 520 or HPA 531 or HPA 550; or consent of the instructor.

550
Topics in Health Informatics 4 hours.
Current theories and methods in health informatics. **Same as** BHIS 530. Taught online only. A UIC netid is required.

Prerequisite(s): HPA 510 or BHIS 510; and HPA 520 or BHIS 515, or HPA 531 or BHIS 520, or HPA 540 or BHIS 525; and graduate standing and consent of the instructor.

551
Marketing Health Programs 3 hours.
Concepts of marketing as a management tool; application of marketing to healthcare—the marketing process, marketing resources, and strategies for accomplishing marketing objectives. **Prerequisite(s):** HPA 400 or MKTG 563 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 U.S. **Prerequisite(s):** 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. **Prerequisite(s):** BSTT 400 and BSTT 401; or consent of the instructor.

563
Web-Based Public Health Information Systems 4 hours.
Examination of Web-based applications in public health practice

and factors in the design of Web-based public health education and database systems. This is an online course. **Prerequisite(s):** HPA 465; and consent of the instructor. Unless otherwise permitted, limited to students in the public health informatics track of HPA.

564
Geographic Information System Application in Public Health 3 hours.
Examination of GIS applications in Public Health and the process of designing a GIS-based public health investigation. **Same as** EOHS 564. This is an online course. **Prerequisite(s):** BSTT 400 and HPA 465 and consent of the instructor.

565
Datamining Applications in Public Health 3 hours.
Presents the key public health information system sources, describes the process of datamining, and introduces the student to a sample of datamining techniques. **Same as** EOHS 565. Extensive computer use required. **Prerequisite(s):** BSTT 400.

573
Principles of Economic Evaluations of Healthcare Interventions 3 hours.
Principles, models, and practical methods for the economic evaluation of healthcare services with an emphasis on pharmaceutical care. **Same as** PMAD 573. Previously listed as PMAD 571. **Prerequisite(s):** Graduate standing; and consent of the instructor.

590
Grant Writing 1 hour.
Students will learn how to write a grant application through the guidance of a mentoring committee. They will formulate a research proposal which will be presented to a panel of researchers who will critique the proposed study.

594
Advanced Special Topics in Health Policy and Administration 1 TO 4 hours.
Advanced topics in health administration, policy analysis, healthcare financing, cost-effectiveness evaluation. Topics vary by semester. **Prerequisite(s):** Consent of the instructor.

Histology (HSTL)

451
Oral Histology 4 hours.
Comprehensive learning experiences in the structure and function of human tissue, organs, and organ systems with special emphasis on the oral cavity. Registration in HSTL 452 is required in the Spring term. **Prerequisite(s):** Approval of the department students.

452
Histology II 4 hours.
Continuation of HSTL 451. Provides a base line of normal structure and function of human tissues necessary for the study of Oral Pathology and advanced courses in Histology. **Prerequisite(s):** HSTL 451; and approval of the department or first-year standing in the Doctor of Dental Surgery Program.

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. **Prerequisite(s):** 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. **Prerequisite(s):** HSTL 452 and HSTL 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. **Prerequisite(s):** HSTL 452, a course in microbiology and consent of the instructor.

507
Physiological Basis of Pathology 2 hours.
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." **Same as** PATH 507. **Prerequisite(s):** HSTL 452 or PATH 421 and PATH 422.





514
Oral Biology Seminar 1 hour.
Invited speakers present the progress of current research work in their field of interest related to oral tissues. **Same as** OMDS 527. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

515
Electron Microscopy in Dentistry 1 hour.
Principles, theory, and practice of transmission and scanning electron microscopy, and energy dispersive X-ray microanalysis. Processing, sectioning, staining, and examination of tissues. **Same as** OMDS 529. **Prerequisite(s):** Consent of the instructor.

History (HIST)

400
Topics in Ancient History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

401
Topics in Greek History 3 OR 4 hours.
Specific topics are announced each term. **Same as** CL 401. 3 undergraduate hours. 4 graduate hours. May be repeated. **Prerequisite(s):** 3 hours of history or classics.

402
Topics in Roman History 3 OR 4 hours.
Specific topics are announced each term. **Same as** CL 402. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or classics.

403
Culture and Sexuality: Cultural History of Same-Sex Relations 3 OR 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. **Same as** GWS 403. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or consent of the instructor.

404
Roman Law and the Civil Law Tradition 3 OR 4 hours.
Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. **Same as** CL 404, and CRJ 404. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 200 or CL 203 or HIST 203 or consent of the instructor.

406
Topics in Medieval History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history, or junior standing or above, or consent of the instructor.

409
Topics in Early Modern European History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

410
Topics in Modern European History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

415
American Indian Ethnohistory 3 OR 4 hours.
Introduction to ethnohistory, an interdisciplinary approach to researching, conceptualizing, and writing American Indian history. The course is organized topically and centers on classic and current monographs and articles. **Same as** NAST 415. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or above and consent of the instructor. **Recommended background:** Courses in cultural anthropology, American Indian anthropology, American Indian literature.

418
Topics in German History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be

repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of European history, or consent of the instructor.

420
Teaching the Social Sciences 3 OR 4 hours.
This course focuses on acquiring and practicing the skills for teaching the social sciences at the secondary level within the context of history. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 9 hours of credit in the social sciences and approval of the instructor.

421
Topics in British and Irish History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of history or consent of the instructor.

424
Topics in French History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** One 200-level course in French or European history or consent of the instructor.

429
Topics in Italian History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

433
Topics in Eastern European History 3 OR 4 hours.
Specific topics are announced each term. **Same as** SLAV 433. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of European history or consent of the instructor.

435
Topics in Russian History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of European history or consent of the instructor.

441
Topics in African History 3 OR 4 hours.
Specific topics are announced each term. **Same as** AAST 441. 3 undergraduate hours. 4 graduate hours. May be repeated.

Prerequisite(s): 3 hours of African history, African-American studies, or consent of the instructor.

445
History of Islam in the African World 3 OR 4 hours.
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. **Same as** AAST 445. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Consent of the instructor.

451
Topics in Colonial American History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of U.S. history or consent of the instructor.

452
Topics in Revolutionary and Early National United States History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

453
Topics in Nineteenth-Century United States History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

454
Topics in Twentieth-Century United States History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of U.S. history or consent of the instructor.

455
Topics in Southern History 3 OR 4 hours.
Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in

more than one section per term.

Prerequisite(s): 3 hours of history.

**456
Topics in the History of
Communications 3 OR 4 hours.**

This course introduces students to major developments in the history of communications, with a focus on the political and cultural dimension of technologies. **Same as COMM 456.** 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Consent of the instructor. **Recommended background:** At least one history course at the 100-level.

**461
Topics in Latin American
History 3 OR 4 hours.**

Specific topics are announced each term. **Same as LALS 461.** 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history, Latin American and Latino studies, or consent of the instructor.

**472
Issues and Events in
Twentieth-Century
China 3 OR 4 hours.**

Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history. **Same as ASST 472.** 3 undergraduate hours. 4 graduate hours. **Recommended background:** Previous course work in Chinese history at the 100- or 200-level.

**473
Topics in East Asian
History 3 OR 4 hours.**

Specific topics are announced each term. **Same as ASST 473.** 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of East Asian history or consent of the instructor.

**475
Educational Practice with
Seminar I 6 hours.**

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

**476
Educational Practice with
Seminar II 6 hours.**

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in HIST 475, and approval of the department.

**477
Topics in
Middle Eastern
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history.

**478
Women in
Chinese
History 3 OR 4 hours.**

Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution, and the historiography of the field. **Same as ASST 478 and GWS 478.** 3 undergraduate hours. 4 graduate hours.

Recommended background: Previous course work in Chinese history or women's studies.

**479
Culture and
Colonialism in
South Asia 3 OR 4 hours.**

Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947. **Same as ANTH 479 and ASST 479.** 3 undergraduate hours. 4 graduate hours.

**480
Topics in
Economic
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or consent of the instructor.

**481
Topics in Social
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**482
Topics in Migration
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**483
Topics in the
History of
Public Policy 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**484
Topics in the
History of
Women 3 OR 4 hours.**

Specific topics are announced each term. **Same as GWS 484.** 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or gender and women's studies or consent of the instructor.

**485
Topics in
African-American
History 3 OR 4 hours.**

African-American history for students with significant background in the field. Topics vary. **Same as AAST 481.** 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. Students may register in more than one section per term.

Prerequisite(s): AAST 247 or AAST 248 or HIST 104 or HIST 247 or HIST 248 or consent of the instructor.

**486
Topics in the History of
Science 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 credit hours of history.

**487
Topics in the
History of
Sexuality 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours in history or consent of the instructor.

**488
Topics in Urban
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**489
Topics in
Military
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**490
Topics in Diplomatic
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**491
Topics in
Constitutional
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**492
Topics in
Intellectual
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**493
Topics in
Historiography 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in



more than one section per term.

Prerequisite(s): 3 hours of history.

**494
Topics in Political
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history.

**495
Topics in Religious
History 3 OR 4 hours.**

Specific topics are announced each term. **Same as** RELS 495. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history or consent of the instructor.

**496
Topics in Race,
Ethnic and
Minority
History 3 OR 4 hours.**

Specific topics are announced each term. **Same as** AAST 496. 3 undergraduate hours. 4 graduate hours. May be repeated.

Prerequisite(s): 3 hours of history or consent of the instructor.

**497
Topics in Cultural
History 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history or consent of the instructor.

**498
Topics in
Quantitative
Methods 3 OR 4 hours.**

Specific topics are announced each term. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 3 hours of history or consent of the instructor.

**500
Colloquium on the
Teaching of
History 1 TO 4 hours.**

Reading in topics. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

**501
Introduction to
Graduate Study in
History 4 hours.**

Introduction to history as a discipline and profession. Approach is comparative and by topic. Required for graduate students in the MA and PhD in History programs. **Prerequisite(s):** Graduate standing in history.

**502
Seminar on
Ancient History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

**503
Colloquium on
World History 4 hours.**

Graduate introduction to theories and historiography of the new world history. **Prerequisite(s):** Open only to PhD degree students; and approval of the department.

**508
Seminar on
Medieval History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**511
Colloquium on
European History 4 hours.**

Reading in topics. May be repeated. Students may register in more than one section per term.

**512
Seminar on
European History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**521
Colloquium on
British History 4 hours.**

Reading in topics. May be repeated. Students may register in more than one section per term.

**522
Seminar on
British History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**532
Seminar on
Russian History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**541
Colloquium on
African History 4 hours.**

Readings on select topics in African history. May be repeated. Students may register in more than one section per term.

**542
Seminar on
African History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**551
Colloquium on
American History 4 hours.**

Reading in topics. May be repeated. Students may register in more than one section per term.

**552
Seminar on
American History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**561
Colloquium on Latin
American History 4 hours.**

Topics on themes in Latin American history. Specific topics are announced each term. **Same as** LALS 561. May be repeated. Students may register in more than one section per term.

**562
Seminar on
Latin American
History 4 hours.**

Research in topics. May be repeated. Students may register in more than one section per term.

**580
Chicago Consortium
in Ancient
History 0 TO 16 hours.**

Holding course for graduate students taking approved course work at other universities through the Chicago Consortium in Ancient History. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Admission to a graduate program and approval of the director of graduate studies.

**591
Preliminary Examination
and Dissertation
Prospectus**

Preparation 1 TO 8 hours. Under the supervision of a faculty mentor, the student will prepare for the preliminary examination and prepare the dissertation prospectus required by the department. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours.

Prerequisite(s): Approval of the department or completion of all didactic course work in the PhD in History program.

**592
Colloquium on
Approaches to
History 4 hours.**

Reading in topics. May be repeated. Students may register in more than one section per term.

**596
Independent
Study 1 TO 4 hours.**

Independent study in selected areas in history. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

**599
PhD Thesis
Research 0 TO 16 hours.**

Thesis research for the PhD in History. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Preliminary examination.

**401
Advanced Honors
Seminar 3 hours.**

Student, faculty, and invited guests act as partners in the in-depth exploration of a focused topic. This interaction is fostered through common readings, written assignments, and open discussions. May be repeated to a maximum of 6 hours. Students may register for more than one section per term.

Prerequisite(s): Sophomore standing or above and consent of the instructor. Graduate students may obtain instructor consent.

Recommended background: HON 201.



Human Nutrition (HN)

413

Principles of Delivering Public Health Nutrition Services 3 hours.

Assessment, planning, and evaluation of community nutrition programs using a systems approach.

420

Clinical Nutrition II 2 hours.

Principles of nutrition, biochemistry, physiology, pathology, education, and psychology related to management of selected diseases (renal disease, AIDS, cancer, and pediatrics). **Prerequisite(s):** HN 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. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** HN 321 and credit or concurrent registration in HN 420; or consent of the instructor.

422

Clinical Nutrition III 2 hours.

Principles of nutrition, biochemistry, physiology, and pathology related to the management of critically ill patients.

Prerequisite(s): HN 309 and HN 420; or consent of the instructor.

423

Clinical Practice III 5 hours.

Clinical practicum which focuses on the nutritional management of critically ill patients or specialized patient populations (renal and pediatric patients). Satisfactory/Unsatisfactory grading only.

Prerequisite(s): HN 421 and credit or concurrent registration in HN 422; or consent of the instructor.

450

Professional Practice 6 hours.

Extended practicum which integrates acquired skills, knowledge, and attitudes in dietetics. Special emphasis on current dietetic issues facing the healthcare professional. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): HN 423; 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(s): HN 410; or consent of the instructor.

510

Nutrition—Physiological Aspects 3 hours.

A thorough discussion of the absorption, transport, and metabolism of macronutrients, plus factors affecting these processes. Treats in an integrated fashion how various organs participate.

Prerequisite(s): HN 410 and PHYB 341 or the equivalent, or consent of the instructor.

514

Vitamins in Human Nutrition 2 hours.

Clinical aspects of vitamin requirements and metabolism in human nutrition; bioavailability, nutrient interactions and interrelationships of vitamins with various disease states. **Prerequisite(s):** HN 410; or consent of the instructor.

515

Minerals in Human Nutrition 2 hours.

Clinical aspects of essential mineral requirements and metabolism in human nutrition; bioavailability, nutrient interactions and trace and ultratrace elements.

Prerequisite(s): HN 410; or consent of the instructor.

530

Research Methods in Human Nutrition 3 hours.

Research designs in human nutrition; conceptual issues in clinical and population studies; problems in collection and analysis of dietary, behavioral, and self-reported data. **Prerequisite(s):** AHS 510; 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(s): HN 410; or consent of the instructor.

535

Nutrition and Human Performance 2 hours.

Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. **Same as** MVSC 535. **Prerequisite(s):** HN 410; and PHYB 341 or MVSC 352; or consent of the instructor.

541

Research on Clinical Nutrition Problems 2 hours.

Development and conduct of research on clinical nutrition problems, patient outcomes, or nutri-

tion or food service delivery systems within a hospital or ambulatory care setting.

Prerequisite(s): Consent of the instructor.

550

Quantitative Methods in Nutritional and Epidemiological Studies 3 hours.

Address methodological issues of nutritional/epidemiologic studies; discuss concepts, principles, study designs, statistical methods, and specific issues, such as measurement error/remedies, energy adjustment; practice data management/analysis. Extensive computer use required.

Prerequisite(s): HN 200 and BSTT 400 and 410 and EPID 400; 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(s):** HN 422; or consent of the instructor.

580

Advanced Field Practicum 2 hours.

Advanced practical 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(s): HN 410; or consent of the instructor.

581

Dietetics/Nutrition Instructional Practicum 2 hours.

Teaching practicum in clinical dietetics and/or nutrition.

Prerequisite(s): HN 201 and HN 410 and HN 570 or the equivalent, or consent of the instructor.

594

Special Topics in Human Nutrition 1 TO 4 hours.

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. May be repeated. **Prerequisite(s):** HN 410; or consent of the instructor.

595

Seminar in Human Nutrition 1 hour.

Topics of current interest in human nutrition. Includes discussions of current journal articles and important new developments in the specific disciplines. Satisfactory/

Unsatisfactory grading only. May be repeated with approval.

Approval to repeat course granted by the department.

Prerequisite(s): HN 410; or consent of the instructor.

596

Independent Study in Human Nutrition 1 TO 4 hours.

Study in selected areas of human nutrition is carried out under the direction of a faculty member.

Modes of investigation are determined by the nature of the problem selected. May be repeated.

Students may register in more than one section per term.

Prerequisite(s): Admission to the human nutrition graduate program and consent of the instructor.

597

Project Research 1 TO 4 hours.

For graduate students who wish to pursue a project other than thesis research. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 4 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

598

Research in Human Nutrition 0 TO 16 hours.

Independent research in one area of human nutrition. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Prerequisite(s): Consent of the instructor.

Prerequisite(s): Consent of the instructor.

Prerequisite(s): Consent of the instructor.

599

PhD Thesis Research 0 TO 16 hours.

Independent dissertation research by the student, under the guidance of the adviser. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the faculty adviser.

Industrial Engineering (IE)

411

Mechatronics I 0 TO 4 hours.

Elements of mechatronic systems, sensors, actuators, microcontrollers, modeling, hardware in the loop simulations, real-time software, Electromechanical systems laboratory experiments. **Same as** ME 411. 3 undergraduate hours. 4 graduate hours. Extensive computer use required.

Prerequisite(s): Senior standing or above or approval of the department.





412
Dynamic Systems
Analysis I 3 OR 4 hours.
Classical control theory, concept of feedback, laplace transform, transfer functions, control system characteristics, root locus, frequency response, compensator design. **Same as** ME 412. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 308.

446
Quality Control and Reliability 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 342.

461
Safety Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 342.

463
Plant Layout and Materials Handling 3 OR 4 hours.
Facilities design functions, computer-aided plant layout, facility location, warehouse layout Minimax location, deterministic and probabilistic conveyor models. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 471.

464
Virtual Automation 3 OR 4 hours.
Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing; industrial robots and automated factory models within virtual environments. **Same as** ME 464. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 201; and CS 107 or CS 108.

465
Manufacturing Information Systems 0 TO 4 hours.
Design and implementation of supervisory control and data acquisition systems; manufacturing systems controller and communication networks. 3

undergraduate hours. 4 graduate hours. **Prerequisite(s):** Senior or graduate standing, or consent of the instructor; and familiarity with computer programming.

466
Production Planning and Inventory Control 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 345 and IE 471.

467
Industrial Systems Simulation 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 107 or CS 108.

468
Virtual Manufacturing 3 OR 4 hours.
Virtual reality applications in manufacturing systems design, manufacturing applications of networked virtual reality, virtual reality modeling of occupational safety engineering. **Same as** ME 468. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 107 or CS 108.

471
Operations Research I 3 OR 4 hours.
Introduction to operations research, formulation of linear programming problems, simplex methods, duality theory, sensitivity analysis, network models, and integer linear programming. 3 undergraduate hours. 4 graduate hours. No graduate credit for industrial engineering majors. **Prerequisite(s):** MATH 210.

472
Operations Research II 3 OR 4 hours.
Nonlinear programming problems, unconstrained optimization search techniques. Kuhn-Tucker theorems, quadratic programming, separable programming, Markov chain, queuing theory, and dynamic programming. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IE 342 and IE 471 or graduate standing.

494
Special Topics in Industrial Engineering 3 OR 4 hours.
Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. 3 undergraduate hours. 4 graduate hours. May be repeated. **Prerequisite(s):** Consent of the instructor.

511
Mechatronics II 4 hours.
Microcontrollers used in electro-mechanical systems for measurement and control purposes, interface hardware, real-time software and development tools, applications in robotic motion control and factory automation. **Same as** ME 511. **Prerequisite(s):** ME 411 and consent of the instructor.

542
Advanced Computational Methods for Product and Process Design 4 hours.
Deterministic and statistical methods for modeling and optimizing engineering systems, in the broad context of product design, manufacturing process development, and designing for life cycle issues. **Same as** ME 542. **Prerequisite(s):** Programming language experience.

552
Applied Stochastic Processes 4 hours.
Stationary point processes; Markov renewal theory; semi-Markov processes; regenerative processes; computational methods and applications to queues, inventories, dams, and reliability. **Prerequisite(s):** IE 342.

562
Supervisory Control of Discrete Event Systems 4 hours.
Discrete event systems; languages and automata, supervisory control, timed models, supervisory control applications. Extensive computer use required.

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(s):** CS 102 or CS 107 or the equivalent.

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, and experimental design. **Prerequisite(s):** IE 467.

569
Advanced Virtual Manufacturing 4 hours.
Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. **Same as** ME 569. **Prerequisite(s):** Consent of the instructor.

571
Statistical Quality Control and Assurance 4 hours.
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. **Same as** IDS 571. **Prerequisite(s):** At least one term of statistics.

575
Integer and Combinatorial Optimization 4 hours.
Modeling, computational complexity, polyhedral theory, valid inequalities, duality and relaxation, branch-and-bound algorithms, cutting plane algorithms, heuristic algorithms, and real-world application. **Prerequisite(s):** IE 471.

576
Nonlinear Optimization 4 hours.
Convex analysis, line search techniques, unconstrained and constrained optimization, optimality conditions, duality, convex and nonconvex optimization, large-scale optimization, and real-world applications. **Prerequisite(s):** IE 471 or the equivalent.

594
Current Topics in Industrial Engineering 4 hours.
Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. May be repeated. **Prerequisite(s):** Consent of the instructor.

595
Seminar on Industrial Engineering Research 1 hour.
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. Satisfactory/
Unsatisfactory grading only.
Prerequisite(s): Graduate standing in industrial engineering.

596

Independent**Study 1 TO 4 hours.**

Individual study under close supervision of a faculty member. May be repeated to a maximum of 4 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

598

MS Thesis**Research 0 TO 16 hours.**

Individual research in specialized problems under close faculty supervision. Satisfactory/
Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

599

PhD Thesis**Research 0 TO 16 hours.**

Individual research on specialized problems under close faculty supervision. Satisfactory/
Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Information and Decision Sciences (IDS)

400

Advanced Business**Programming****Using Visual****Tools 0 TO 4 hours.**

Visual extended business language capabilities, including creating and using controls, menus and dialogs, objects and instances, mouse events, graphics, file-system controls. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IDS 201 or a programming course in mathematics or computer science, or consent of the instructor.

401

Business Object**Programming****Using Java 0 TO 4 hours.**

Basic concepts in object-oriented programming such as objects, classes, class inheritance and interfaces, data abstraction and encapsulation, polymorphism, and dynamic binding. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 201 or the equivalent.

403

Information**Security 3 OR 4 hours.**

Examine the field of information security to prepare students for their future roles as business decision makers. Presents a balance

of the managerial and technical aspects of information security. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 100 or the equivalent.

405

Business Systems**Analysis and****Design 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 201.

406

Business Systems**Design Project 3 OR 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 project at an outside company or university office. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 201 and IDS 405 or the equivalent courses; or consent of the instructor. Business administration students must have declared a major.

410

Business Database**Technology 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 201.

412

Distributed**Business****Systems 3 OR 4 hours.**

Organizational aspects and underlying concepts of distributed business systems, decentralization versus centralization issues, costs of distributed computing, and performance evaluation measures. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Credit or concurrent registration in IDS 201.

413

Internet Technology and**Management 3 hours.**

The technologies of World Wide Web development. Topics include: TCP/IP, HTTP, HTML, HTML authoring, XML, Perl, ASP programming, J2EE, Web servers, database servers, business application servers and Internet. Credit is not

given for IDS 413 if the student has credit for IDS 424. Extensive computer use required.

Prerequisite(s): IDS 201 and IDS 410.

420

Business**Systems****Simulation 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Credit or concurrent registration in IDS 201 or credit or concurrent registration in IDS 331; and IDS 355; and MATH 205 or the equivalent.

422

Knowledge**Management****Systems 3 OR 4 hours.**

Computer-based methods for decision support. It aims at providing exposure and insights into a range of approaches and tools for decision aiding, and how they can be utilized in supporting various managerial decision processes. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 410 or consent of the instructor.

435

Optimization Models**and Methods 3 OR 4 hours.**

Linear, nonlinear, dynamic programming, combinatorial methods. Use of spreadsheet and other software tools. Duality, sensitivity analysis. Models for business operations and planning, computer systems, transportation, and finance. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 355; and MATH 205 or the equivalent. Business administration students must have declared a major.

437

Stochastic**Methods 3 OR 4 hours.**

Stochastic processes and other applications of probability theory. Use of spreadsheet and other software tools for analysis, simulation, and decision theory. Models for business operations and planning, computer systems, transportation, and finance. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IDS 355 and MATH 205.

446

Decision**Analysis 3 OR 4 hours.**

Prior and posterior distributions; conjugate priors; value of information; applications to decision making in business. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IDS 371.

450

Advanced**Operations****Management 0 TO 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. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** IDS 355 or the equivalent. Business administration students must have declared a major.

454

Introduction to**Supply Chain****Management 3 OR 4 hours.**

Supply chain management is studied as an information-intensive, integrated system for managing material flows, logistics, and interorganizational partnership to deliver products and services. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 450.

460

Survey Sampling:**Theory and****Methods 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 371.

462

Statistical Software**for Business****Applications 3 OR 4 hours.**

Statistical software in business applications and data mining. SAS and other packages such as SPSS, MatLab, Maple, Splus, B34S, SCA. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IDS 371 or consent of the instructor.

470

Multivariate**Analysis 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 371; and MATH 205 or MATH 310 or MATH 320.



472 Business Data Mining 3 OR 4 hours.
Searching for relationships between variables in databases. Decision trees, cluster analysis, logistic regression, path analysis. Applications to marketing, quality assurance, operations management, human resources. 3 undergraduate hours. 4 graduate hours. Credit is not given for IDS 472 if the student has credit for IDS 572. **Prerequisite(s):** IDS 371 or the equivalent.

473 Introduction to Risk Management 3 hours.
Introduction to risk management. Loan and credit management; credit scoring. Risk measurements and reserves; banking and insurance capital requirements, the BASEL accord, tail events, and catastrophic event insurance. Financial contracts and hedging. **Same as** FIN 473. **Prerequisite(s):** FIN 300 and IDS 371.

474 Quality and Productivity Improvement Using Statistical Methods 3 OR 4 hours.
Directed experimentation for quality and productivity improvement, quality surveillance, design and analysis of two-level factorial experiments and multi-level experiments, and data transformation. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 371 or consent of the instructor.

475 Database Accounting Systems 3 OR 4 hours.
Concepts and principles of designing database systems to perform accounting functions, applications of microcomputer accounting software packages systems design tools, and computerized transaction cycles. **Same as** ACTG 475. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** ACTG 111 and IDS 100.

476 Business Forecasting Using Time Series Methods 3 OR 4 hours.
Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multi-variable transfer function models is also included. **Same as** ECON 450. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 371 or ECON 346 or consent of the instructor.

478 Regression Analysis 3 OR 4 hours.
Data collection and exploration; model building; variable least squares; residual analysis; variable selection; multicollinearity; ridge regression; nonlinear regression; nonparametric regression. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** IDS 371.

494 Topics in Information and Decision Sciences 3 OR 4 hours.
Topics vary; selected readings; case analysis. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time if topics vary. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** Senior standing in the College of Business Administration and completion of all other CBA core courses, or consent of the instructor.

499 Independent Study in Information and Decision Sciences 1 TO 3 hours.
Intensive study of selected topics determined in consultation with the instructor and department head. May be repeated to a maximum of 9 hours. Students may register in more than one section per term. **Prerequisite(s):** Major in Information and Decision Sciences and consent of the instructor.

500 Information Systems in Organizations 4 hours.
Use of information technology in business; planning, management, and strategic use of information technology including the role of enterprise-wide systems, the Internet, and electronic commerce. **Prerequisite(s):** Admission to the MBA Program.

504 Introduction to Electronic Commerce 4 hours.
Addresses issues on electronic commerce for businesses and consumers, considering topics such as competition, distribution, infrastructure on the Internet, shopping, and product characteristics.

505 Business Information Systems Analysis and Design 4 hours.
Analysis, design and development of information systems. Management concerns in systems design, development, and evaluation. A student who has taken IDS 405 must see an adviser to determine whether another graduate course from IDS, MATH, or CS must be substituted for IDS 505. **Prerequisite(s):** IDS 500; or consent of the instructor.

506 Survey of Healthcare and Information Technology 4 hours.
Impact, use, and trends of information technology in healthcare. Healthcare systems technology and stakeholders. Analysis of strategic, economic, operational, ethical, privacy, and security considerations. **Prerequisite(s):** Introductory information systems course is required. **Recommended background:** Advanced information system courses such as databases and system analysis.

507 Advanced Systems Analysis and Design Project 4 hours.
Principles and concepts of analysis, design, and development of information systems including project management. Includes a project at an outside company or university office. **Prerequisite(s):** Consent of the instructor. and completion of three MS in MIS courses.

508 E-commerce Project 4 hours.
Electronic commerce project initiated by local small and medium enterprises, teaming students with technical or entrepreneurial skills/interests, supervised by faculty on board of directors. **Prerequisite(s):** IDS 504 or MGMT 558 or MKTG 558; and consent of the instructor.

509 Business Process Analysis and Modeling 4 hours.
Principles and concepts for the analysis and design of business processes and for the development of information systems that support such processes. **Prerequisite(s):** IDS 401 or consent of the instructor.

510 Organizational Data Resources 4 hours.
Data as a competitive resource. Understanding, organizing, and utilizing data in enterprises. Data resource development and management. Leveraging data assets. Exploiting the power of data. Understanding regulatory requirements. A student who has taken IDS 410 must see an adviser to determine whether another graduate course from IDS, MATH, or CS must be substituted for IDS 510. **Prerequisite(s):** IDS 500.

511 Query Processing in Database Systems 4 hours.
Query processing in deductive databases and in distributed/parallel databases systems. **Same as** CS 580. **Prerequisite(s):** CS 480.

512 Information Systems Project and Program Management 4 hours.
Theory and practice of managing IS projects based on a life cycle management model. Technology, organizational behavior, team dynamics, and economic analysis in the context of larger organizational strategies. Project plans, budgets, and schedules. Extensive computer use required. **Prerequisite(s):** Introductory information systems course. **Recommended background:** Advanced information system courses such as databases and system analysis.

513 Enterprise Components and Web Services 4 hours.
Exposes students to advances in the technical aspects of electronic business. The key emphasis is on developing Web-based electronic business applications. Extensive computer use required.

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(s):** IDS 505 or IDS 510.

515 Information Systems Strategy and Policy 4 hours.
Examines how businesses can leverage IT and digital technologies to maximize business performance. Covers IS strategy

formulation, strategy implementation, e-business transformation, interorganizational and multi-organizational IS strategies.

Prerequisite(s): IDS 505 or IDS 510; or consent of the instructor.

516

Data Warehousing and Decision Support 4 hours.

Analysis, design, and development of data warehousing. Related methods and tools in the provision of decision support and business analytics/intelligence.

Prerequisite(s): IDS 505 or IDS 510 or consent of the instructor.

517

Enterprise Application Infrastructure 4 hours.

The course explores the choices available for building an enterprise applications infrastructure. Topics such as advanced applications design, development, tools, methodologies, and technologies will be covered. Extensive computer use required.

Prerequisite(s): IDS 201 or IDS 400 and IDS 401 and IDS 410 or the equivalent.

518

Electronic Marketing 4 hours.

Overview of the electronic marketing value chain. Internet and Web technologies, system design, payment systems, business requirements for e-marketing, design, and ethical issues. **Same as** MKTG 518. **Prerequisite(s):** MKTG 500 or MBA 506 or consent of the instructor.

519

Topics in Information Systems 4 hours.

Selected topics in information systems, information management, and information technology.

Content varies. Topics will be announced. May be repeated if topics vary. **Prerequisite(s):** IDS 505 or IDS 510; and consent of the instructor.

520

Distributed Processing and Telecommunication Systems 4 hours.

Topics include components of telecommunications and distributed information systems, data communication devices, computer networks, configuration management, and distributed databases. **Prerequisite(s):** IDS 505 or IDS 510.

521

Advanced Database Management 4 hours.

Data analysis for database design; logical data modeling, transaction modeling; implementation models; physical database design; database tuning and performance

evaluation; database decomposition; distributed database; database security. **Prerequisite(s):** IDS 505 or IDS 510.

523

Audit and Control of Information Systems 4 hours.

Modeling and analysis of information systems application in organizations; measurement of effectiveness; strategies for implementation and updating; interface with other management control systems. **Prerequisite(s):** IDS 505 or IDS 510.

526

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, multiaccess systems, input/output systems, priority queues, and paging systems. A student who has taken IDS 426 must see an adviser to determine whether another graduate course from IDS, MATH, or CS must be substituted for IDS 526.

Prerequisite(s): IDS 532; and IDS 505 or IDS 510.

529

Seminar on Management Information Systems 4 hours.

Special research topics in management information systems. Topics vary from term to term depending on the interests of the instructor and students. May be repeated if topics vary.

Prerequisite(s): IDS 505 or IDS 510.

532

Introduction to Operations Management 4 hours.

The management of operations for the production and delivery of goods and services. Topics include the management of projects, production, supply chain, inventory, and quality. Credit is not given for IDS 532 if the student has credit in MBA 507 and MBA 509.

Prerequisite(s): Admission to the MBA Program.

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(s):** Credit or concurrent registration in IDS 532 or the consent of the instructor.

552

Supply Chain 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(s): Credit or concurrent registration in IDS 532 or the consent of the instructor.

553

Production Process 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(s): IDS 532.

570

Statistics for Management 4 hours.

Survey of statistical methods with applications for business and management. **Prerequisite(s):** Admission to any business graduate program or consent of the instructor.

571

Statistical Quality Control and Assurance 4 hours.

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. **Same as** IE 571. **Prerequisite(s):** At least one term of statistics.

572

Data Mining for Business 4 hours.

Introduction to data mining for business. Applications to marketing, credit scoring, quality assurance, operations management, and human resources management. Credit is not given for IDS 572 if the student has credit for IDS 472. **Prerequisite(s):** IDS 532.

573

Risk Management 4 hours.

Introduction to risk management. Risk measurements and reserves; banking and insurance capital requirements, the BASEL accord, tail events, catastrophic event insurance, reinsurance. Financial contracts and hedging. **Same as** FIN 573. **Prerequisite(s):** Credit or concurrent registration in IDS 570 and FIN 500.

577

Research Methodology I 4 hours.

Use of statistics and computers in research. Data collection and organization, survey sampling, questionnaire design, experimental design. **Prerequisite(s):** IDS 532 or the equivalent and admission to the PhD program in Business Administration.

578

Research Methodology II 4 hours.

Data analysis, including estimation, hypotheses testing, nonparametric methods, analysis of variance, regression analysis, economic forecasting, and time series. **Prerequisite(s):** IDS 577 or the equivalent.

582

Business Research and Forecasting I 4 hours.

The role of research in business; forecasting methods and techniques, including models and their applications. **Same as** ECON 537. **Prerequisite(s):** ECON 534 and at least one statistics course with regression analysis at the 300-level or above.

583

Business Research and Forecasting II 4 hours.

The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. **Same as** ECON 538. **Prerequisite(s):** IDS 476 or IDS 582 or ECON 537.

594

Special Topics in Information and Decision Sciences 4 hours.

Intensive study of a selected topic. Content varies. Topics are announced. **Prerequisite(s):** Consent of the instructor.

595

Seminar in Information and Decision Sciences 1 TO 4 hours.

Topics vary from term to term depending on the interests of the instructor. May be taken for up to four credit hours depending on the outline of the seminar as determined by the instructor. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. Students may register for more than one section per term. **Prerequisite(s):** Admission to the PhD program in Business Administration or the PhD program in Management Information Systems.





596
Independent Study in Information and Decision Sciences 1 TO 4 hours.
Independent study under the direction of a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

599
PhD Thesis Research 0 TO 16 hours.
Research on topic of the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

Interdisciplinary Public Health Sciences (IPHS)

494
Introductory Special Topics—Inter-departmental 1 TO 4 hours.
Introductory special topics in public health. Course content will vary from semester to semester. May be repeated. Students may register in more than one section per term.

501
Public Health Leadership Seminar I 3 hours.
Doctoral seminar in advanced public health leadership topics, primarily for DrPH degree students. **Prerequisite(s):** Enrollment in the DrPH program or consent of the instructor.

502
Public Health Leadership Seminar II 3 hours.
Doctoral seminar in advanced public health leadership topics. Primarily for DrPH degree students. **Prerequisite(s):** Enrollment in the DrPH program or consent of the instructor.

503
Public Health Integrative Seminar I 3 hours.
Doctoral seminar in advanced public health leadership topics, primarily for DrPH degree students. **Prerequisite(s):** Consent of the instructor. **Recommended background:** Enrollment in the DrPH or PhD degree program.

504
Public Health Integrative Seminar II 3 hours.
Doctoral integrative seminar in advanced public health topics, pri-

marily for DrPH degree students. **Prerequisite(s):** IPHS 503 or equivalent experience and consent of the instructor. **Recommended background:** Enrollment in the DrPH or PhD in Public Health degree program.

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. **Prerequisite(s):** CHSC 460 and consent of the instructor.

594
Advanced Special Topics—Inter-departmental 1 TO 4 hours.
Advanced special topics in public health. Course content will vary from semester to semester. May be repeated. Students may register in more than one section per term.

595
Seminar in Interdisciplinary Public Health Sciences 1 TO 3 hours.
Analysis of current research in public health. Course content will vary from semester to semester. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596
Independent Study in Public Health 1 TO 4 hours.
Selected aspects of specific public health problems; independents study under close supervision of faculty. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of instructor who has supervised at least one course in the area of the independent study.

598
Research in Public Health Sciences—MS 0 TO 16 hours.
Individual research in public health directed by a faculty member. Directed toward the thesis requirements for the Master of Science degree. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

599
Research in Public Health Sciences—PhD 0 TO 16 hours.
Individual research in public health directed by a faculty member. Directed toward the dissertation for the Doctor of Philosophy degree. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

Interdisciplinary Studies in the Arts (ISA)

400
Advanced Topics in Interdisciplinary Arts 3 OR 4 hours.
Exploration of advanced topics in interdisciplinary arts which include architecture, art and design, art history, music, and theatre. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

500
Topics in Interdisciplinary Studies in the Arts 4 hours.
Provides the opportunity for students to explore interdisciplinary methods in research in specific the arts and historical related topics not covered in a regular course curriculum. May be repeated to a maximum of 8 hours. Course can also be used as a continuing education module in the visual and performing arts as well as preservation studies, museology, architectural and art history. **Prerequisite(s):** Consent of the instructor.

Italian (ITAL)

411
Literary Forms in Early Renaissance 3 OR 4 hours.
The development of epic poetry (Pulci, Boiardo, Ariosto) within the literary, political, and social context (Machiavelli and Castiglione). 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 310 or consent of the instructor.

412
Literary Forms in Late Renaissance and Baroque 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 310 or consent of the instructor.

421
Modern Italian Literature II 3 OR 4 hours.
From Romanticism to Decadentism: emphasis on the work of Leopardi and Manzoni; analysis of poems by Carducci, Pascoli, D'Annunzio, Gozzano. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 311 or consent of the instructor.

422
Contemporary Italian Literature 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 322 or consent of the instructor.

450
Divina Commedia I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 310 or consent of the instructor.

451
Divina Commedia II 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ITAL 310 or consent of the instructor.

461
Educational Practice with Seminar I 6 hours.
The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

462
Educational Practice with Seminar II 6 hours.
The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in ITAL 461, and approval of the department.

494

Special Topics 3 OR 4 hours.

Topics will vary from term to term and may cover such areas as literary theory or culture. **Same as** FR 494 and SPAN 494. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. Taught in English.

Prerequisite(s): Junior standing or above; and approval of the department.

Jewish Studies (JST)

478

The Bible as**Literature 3 OR 4 hours.**

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. **Same as** ENGL 478 and RELS 478. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in ENGL 240; and grade of C or better in ENGL 241 or grade of C or better in ENGL 242; or grade of C or better in ENGL 243; or consent of the instructor.

494

Topics in**Jewish Studies 3 OR 4 hours.**

Selected topics in Jewish studies. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 6 hours if topics vary.

Prerequisite(s): JST 101 or JST 102 or consent of the instructor.

Latin (LAT)

499

Independent**Reading 3 OR 4 hours.**

Individual study under faculty direction. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 4 hours in Latin at the 200-level or the equivalent.

Latin American and Latino Studies (LALS)

409

Ancient Maya Writing, Language, and Culture 3 OR 4 hours.

Recent trends in Maya epigraphy, information gained from Maya hieroglyphs, linguistics, and histor-

ical ethnographies are applied to anthropological analyses of past lifeways. **Same as** ANTH 409. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

423

Andean**Prehistory 3 OR 4 hours.**

An overview of the cultural evolution of the Andean region from the arrival of the first inhabitants to the development of the Inca empire. **Same as** ANTH 423. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 228 or ANTH 269 or consent of the instructor.

427

Studies in Language Policy and Cultural Identity 3 OR 4 hours.

Examines the development, articulation, and effects of language policies on identity formation and culture. Focuses on the United States and the Spanish language, although other countries and languages are included. **Same as** SPAN 427. 3 undergraduate hours. 4 graduate hours. Taught in English. **Prerequisite(s):** Junior standing or above. Reading and writing knowledge of Spanish.

461

Topics in**Latin American****History 3 OR 4 hours.**

Specific topics are announced each term. **Same as** HIST 461. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history, Latin American and Latino studies, or consent of the instructor.

475

Indians of the**Andes and the****Amazon 3 OR 4 hours.**

Intensive research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given Levi-Strauss' ideas on the formulation of cultural theory in South America. **Same as** ANTH 475. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ANTH 213 or consent of the instructor.

491

Interdisciplinary Seminar in Latin American**Studies 3 OR 4 hours.**

Specific topics as announced each semester. In-depth study of selected topics, such as process of state formation, education, pop-

ulism, the family, democratization, industrialization, and ideological currents. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary.

Prerequisite(s): Any two 200-level Latin American and Latino Studies courses or consent of the instructor.

495

Interdisciplinary Seminar in**Latino Studies 3 OR 4 hours.**

In-depth study of Latino communities and current issues from an interdisciplinary perspective, with emphasis on the learning and use of investigative methodologies. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. **Prerequisite(s):** Any two 200-level Latin American and Latino Studies courses or consent of the instructor.

499

Advanced**Independent****Study 1 TO 4 hours.**

Individual advanced reading or research project in Latin American or U.S. Latino studies with instructor's consent and supervision. May be repeated to a maximum of 8 hours. Students may register in more than one section per term.

Prerequisite(s): Open, with consent of the instructor, to graduate students and Latin American and Latino studies majors with at least a 3.00 grade point average. Students in other programs or with lower than a 3.00 grade point average are admitted at the 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.

502

Topics in Latin American and Latino Studies 4 hours.

In-depth study of selected research topics related to Latin America and/or U.S. Latinos that reflect the major and most current debates in these fields. May be repeated if topics vary.

Prerequisite(s): Graduate or professional standing; or consent of the instructor.

561

Colloquium on Latin American**History 4 hours.**

Topics on themes in Latin American history. Specific topics are announced each term. **Same as** HIST 561. May be repeated. Students may register in more than one section per term.

596

Independent**Study 1 TO 4 hours.**

Investigation of special problems under the direction of a faculty member. May be repeated to a maximum of 8 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

Liberal Arts and Sciences (LAS)

494

Topics in Cultural**Studies 3 OR 4 hours.**

An interdisciplinary approach to a current cultural debate. Topics will vary. 3 undergraduate hours. 4 graduate hours. May be repeated if topics vary. Taught at the Field Museum.

495

The Newberry Library Undergraduate**Seminar 6 hours.**

Seminar with a topic related to the holdings of the Newberry Library. Classes held in Newberry Library. Topics vary. May be repeated if topics vary. Previously listed as LAS 395. Students are required to conduct research at the Newberry Library beyond designated class hours. Pretour of the Newberry is recommended. **Prerequisite(s):** Consent of UIC's Newberry Library seminar coordinator.

Linguistics (LING)

402

Trial**Interaction 3 OR 4 hours.**

Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. **Same as** CRJ 402. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 261 and CRJ 350; or consent of the instructor.

405

Introduction to General**Linguistics 3 OR 4 hours.**

Introduction to the theories and methods of the phonological, morphological, and syntactic analysis of language. The historical development of languages. Language use. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing.





415
Linguistic Structures I 3 OR 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. 3 undergraduate hours. 4 graduate hours.

425
Linguistic Structures II 3 OR 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. 3 undergraduate hours. 4 graduate hours.

459
Topics in Linguistics 3 OR 4 hours.
Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. Students may register in more than one section per term.
Prerequisite(s): Consent of the instructor.

474
Cognitive Psychology of Language 3 hours.
Provides students with a survey of methods, theory, and research in language and discourse processing. **Same as** COMM 454 and PSCH 454. **Prerequisite(s):** Graduate standing or consent of the instructor.

480
Sociolinguistics 3 OR 4 hours.
Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. **Same as** ANTH 480. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): LING 405 or junior standing and consent of the instructor.

483
Methodology of TESOL 3 OR 4 hours.
Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. **Same as** CIE 483. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing and consent of the instructor.

496
Independent Study 1 TO 4 hours.
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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. A maximum of 6 hours is allowed for undergraduate students, and 8 hours of credit for graduate students. **Prerequisite(s):** 9 hours of linguistics and approval of the head of the department.

506
Cross-Cultural Communication 4 hours.
Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (interactional etiquette, discourse rules). **Same as** COMM 506.

531
Grammar for TESOL 4 hours.
Survey of major grammatical structures and patterns as they relate to TESOL instruction.

540
Language and Gender 4 hours.
Examination of sociolinguistic research and theories on the interrelationships between language and gender, including gender categories in linguistic systems, gender differences in language use, interaction, and cross-cultural comparisons. **Same as** GWS 540.

551
Research Practicum in Sociolinguistics 4 hours.
Strategies and methods for studying language use in communities: participant-observation, interviewing, elicitation, using public-domain data, note taking vs. tape recording, and issues of transcription and ethics. May be repeated to a maximum of 12 hours.
Prerequisite(s): LING 407 or LING 480; or consent of the instructor.

553
Research Practicum in Discourse Analysis 4 hours.
Discourse analysis addresses issues of intentional communication, inference, the structure of texts or talk-in-interaction, and the interactive construction of social actions or identities in discourse. **Same as** ENGL 553. May be repeated to a maximum of 12 hours.

556
Second Language Learning 4 hours.
An introduction to research findings and methods in second language learning. **Same as** SPAN 556. **Prerequisite(s):** Consent of the instructor.

559
Seminar in Linguistics 4 hours.
Advanced study in linguistics. Topics vary. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.
Prerequisite(s): Consent of the instructor.

582
Qualitative Methods in Communication 4 hours.
Qualitative methods course analyzing language and culture patterns. **Same as** COMM 580.
Prerequisite(s): 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(s): 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.
Observation, tutoring, and supervised teaching for teachers of English as a second or foreign language. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 13 hours. Students register for 1 to 12 hours.
Prerequisite(s): LING 583 and consent of the instructor.

596
Independent Study in Linguistics 1 TO 6 hours.
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. May be repeated to a maximum of 6 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and approval of the head of the department.

597
Research in Linguistics 0 TO 16 hours.
Independent research in linguistics. Satisfactory/Unsatisfactory grading only. May be repeated with approval. Approval to repeat course granted by the department. A maximum of 4 hours of credit may be applied toward the MA in Linguistics degree.
Prerequisite(s): Consent of the instructor and the director of graduate studies. Open only to degree candidates.

598
Master's Thesis Research 0 TO 16 hours.
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. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.
Prerequisite(s): Consent of the thesis supervisor and approval of the head of the department. Open only to degree candidates.

Lithuanian (LITH)

410
Structure of Lithuanian 3 OR 4 hours.
Synchronic analysis of the structure of Lithuanian; emphasis on discourse analysis of oral and written texts. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): LITH 405 or 18 hours of Lithuanian or the equivalent.

425
Translation of Lithuanian Texts 3 OR 4 hours.
Problems of translating Lithuanian texts; workshop in translating Lithuanian works into English. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** LITH 302 or consent of the instructor.

499
Independent Study 1 TO 4 hours.
Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Graduate students may register for more than one section per term; undergraduates may only register for one section per term.
Prerequisite(s): Senior or graduate standing, 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.

520
Topics in Historical Lithuanian Linguistics 4 hours.
Covers major topics and trends in historical Lithuanian linguistics: linguistic history, sociolinguistic history, history of grammars, and dictionaries. Will also cover historical sites of various linguistic schools. May be repeated to a maximum of 12 hours. Taught in Lithuanian. **Prerequisite(s):** Consent of the instructor.

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.
Study of a genre, movement, or topic. Content varies. May be repeated to a maximum of 12 hours.

560
Studies in Lithuanian Realism 4 hours.
Study of a topic, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

565
Studies in Twentieth-Century Lithuanian Literature 4 hours.
Study of a topic, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

570
Studies in Lithuanian Literary Criticism 4 hours.
Function of literary criticism in all epochs of Lithuanian literature. May be repeated to a maximum of 12 hours.

596
Independent Study 1 TO 4 hours.
Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and the head of the department.

Management (MGMT)

445
Organizational Analysis and Practice 3 hours.
Emphasis on organizational theories and models to analyze and improve functioning and performance of organizations. Structure, technology, environmental adaptation, and managerial control systems. **Prerequisite(s):** MGMT 340 and junior standing.

447
Organizations 3 OR 4 hours.
Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. **Same as** SOC 447. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 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(s):** Junior standing and 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. **Prerequisite(s):** MGMT 340 and MGMT 350 and junior standing.

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. **Prerequisite(s):** MGMT 340 and MGMT 350 and junior standing.

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. **Prerequisite(s):** MGMT 340 and MGMT 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(s):** 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. **Prerequisite(s):** MGMT 453 and MGMT 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(s):** 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. **Prerequisite(s):** MGMT 340 and MGMT 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(s):** MGMT 340 or the equivalent and junior standing.

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. **Prerequisite(s):** MGMT 340 and MGMT 452, 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. **Prerequisite(s):** MGMT 340 and MGMT 350, or consent of the instructor.

481
Managerial Logistics 3 hours.
Management of activities governing flow of materials and products through stages of production and distribution. Includes design of logistical systems and use of mathematical techniques. **Prerequisite(s):** IDS 355 or consent of the instructor.

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. **Prerequisite(s):** 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(s):** Senior standing and 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(s):** Senior standing in the College of Business Administration and completion of all other CBA core courses, or consent of the instructor.





499 Independent Study in Management 1 TO 3 hours.
Independent study of an approved topic in management. Student must prepare a written report under the guidance of the instructor. May be repeated to a maximum of 6 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the department head.

530 Family Business Management 4 hours.
Special issues facing family-owned and closely-held firms. Emphasis on behavioral, operational, and strategic issues, family dynamics, and interpersonal issues in professional settings; succession planning. **Prerequisite(s):** Admission to the MBA Program. **Recommended background:** MGMT 502 or MKTG 502.

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. **Prerequisite(s):** Admission to the MBA or MS in Accounting program.

541 Organizational Behavior 4 hours.
The organization as a social system. Topics include leadership, interpersonal effectiveness, group behavior, managing change, conflict management, motivation and behavior, and interpersonal communications. Credit is not given for MGMT 541 if the student has credit for MBA 505. **Prerequisite(s):** Admission to MBA or MS in Accounting program.

553 Human Resource Management 4 hours.
Human resource management programs and policies. Staffing, training, and development; historical evolution of personnel policies, modern labor force and technological trends; supervision, salary administration, human resource research and utilization. **Prerequisite(s):** MGMT 541 or consent of the instructor.

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 manage-

ment systems and ideologies. **Prerequisite(s):** MGMT 541.

564 Negotiations 4 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. Credit is not given for MGMT 564 if the student has credit for MGMT 594. Special topics: Negotiations. **Prerequisite(s):** MGMT 541.

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(s):** MGMT 553.

570 Social and Legal Environment of the Firm 4 hours.
Exploration of current ethical, social, political, technological, economic, and global issues as they relate to business and management in setting goals, making decisions, and creating policy. **Prerequisite(s):** ECON 520.

573 Research Methods in Organizational Behavior and Human Resource 4 hours.
Methodologies and industrial design appropriate for research in human resource and relations management, and organizational behavior. Students expected to complete a theoretically based research paper. **Prerequisite(s):** PhD student status or consent of 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(s):** PhD student status or consent of 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 microlevel of human resource management. **Prerequisite(s):** PhD student status or consent of the instructor.

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.

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 microlevel variables and principles and strategies of organizational change and development. **Prerequisite(s):** MGMT 541.

582 Management of Innovation and Technological Change 4 hours.
Analysis of the role of organization structure and management processes in fostering innovation. Emphasis on issues in research and development, flexible manufacturing, government policy, and technology transfer. **Prerequisite(s):** 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(s):** PhD student status or consent of the instructor.

588 Seminar: Topics in Strategic Management 4 hours.
Selected topics and current problems in organizational strategy. Research and fieldwork in strategic planning. Application of theory and concepts to problems in strategic management. **Prerequisite(s):** Admission to the PhD in Business Administration Program.

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 sys-

tems, quality of work life, productivity, and career management. **Prerequisite(s):** PhD student status or consent of the instructor.

590 Strategic Management 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(s):** Enrollment in the final year of the MBA program.

591 Research Apprenticeship 2 TO 4 hours.
Directed training in conducting research in specific areas of management and in developing skills related to the research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

594 Special Topics in Management 1 TO 4 hours.
An intensive study of a selected topic in management. Topics vary by section and by term. May be repeated to a maximum of 12 hours if topics vary. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596 Independent Study in Management 1 TO 4 hours.
Independent study under direction of a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the head of the department.

599 PhD Thesis Research 0 TO 16 hours.
Independent research on topic approved for the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

Marketing (MKTG)

452 Principles of Retailing 3 hours.
The theory and practice of making retailing decisions regarding pricing, product, place and promotion, and the development of strategy based on market competition and trends. **Prerequisite(s):** MKTG 360.

460
Marketing Analytics 3 hours.
Introduction to data-centered analysis for critical aspects of marketing, such as sales forecasting, profitability analysis, market segmentation, promotion budgeting, and database marketing.
Prerequisite(s): MKTG 360 and IDS 270.

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(s): 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. Both qualitative and quantitative methods are employed in developing an analytical framework. **Prerequisite(s):** MKTG 360 and IDS 270.

463
Marketing Channels and E-commerce 3 hours.
Develop an integrated distribution system; relationship to firm's marketing structure (logistics); evaluation of decisions on sources, plant and warehouse location, domestic and international outlets. Analysis by marketing channels and e-commerce role in distribution.
Prerequisite(s): MKTG 360. Business administration students must have declared a major or have received consent of the instructor.

465
Strategic Marketing Planning and Management 3 hours.
Development of marketing plans for strategic and tactical programs to achieve the firm's marketing objectives. **Prerequisite(s):** 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. **Prerequisite(s):** MKTG 360 or consent of the instructor. Business administration students must have declared a major.

469
Global Marketing 3 hours.
The strategic and tactical marketing of goods and services to countries beyond domestic or current markets. Distinct economic, socio-cultural, and political-legal-regulatory environments are considered.
Prerequisite(s): MKTG 360 and BA 200; or consent of the instructor.

471
Services Marketing 3 hours.
An exploration of the special challenges of services marketing, including analyzing and developing solutions for new services, services quality, design and delivery of services, and services recovery.
Prerequisite(s): MKTG 360.

473
The Personal Selling Effort in Marketing 3 hours.
Analysis of selling strategies and tactics in different situations; problems of managing sales force. Cultural differences in selling techniques as well as ethical concerns will be discussed.
Prerequisite(s): 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. Evaluation and critique of an ad campaign. **Prerequisite(s):** 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(s):** MKTG 462 or consent of the instructor.

476
Business-to-Business (B2B) 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(s):** MKTG 360.

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(s): Business administration students must have declared a major.

499
Independent Study in Marketing 3 hours.

Topic and research methodology is to be determined by consultation with the instructor. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.
Prerequisite(s): 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.
Client/consumer behavior and the way institutions respond to such behavior through the planning, pricing, promotion, and distribution of goods and services. Credit is not given for MKTG 500 if the student has credit for MBA 506.
Prerequisite(s): Graduate standing in the College of Business Administration or consent of the instructor.

518
Electronic Marketing 4 hours.
Overview of the electronic marketing value chain. Internet and Web technologies, system design, payment systems, business requirements for e-marketing, design, and ethical issues. **Same as** IDS 518. **Prerequisite(s):** MKTG 500 or MBA 506 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; evaluation and audit.
Prerequisite(s): 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(s): MKTG 500.

563
Information for Marketing Decisions 4 hours.
Definition and selection of appropriate research techniques for solving specific marketing problems. Establishment and adminis-

tration of information systems giving firms a systematic, continuing appraisal of its market position.

Prerequisite(s):
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. Functional characteristics of each of these is assessed in terms of varying marketing situations in the process of formulating the firm's strategy.
Prerequisite(s): 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(s): MKTG 500.

572
International Marketing 4 hours.
Focuses on firms which operate internationally from their home country base. Attention is directed toward working with overseas distributors, promotion and pricing problems, governmental export assistance, and physical distribution matters.
Prerequisite(s): 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(s): 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(s): MKTG 500.

576
Advanced Business-to-Business (B2B) Marketing 4 hours.
Buyer behavior, market segmentation, derived demand, national account programs, system selling, big pricing. Industrial promotion mix, mass communications, and management of sales force.
Prerequisite(s): MKTG 500.





581
Seminars 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(s): Admission to the PhD in Business Administration program.

583
Seminar in 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(s): Admission to the PhD in Business Administration program.

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(s): Admission to the PhD in Business Administration program.

585
Seminar: Topics in Quantitative Models in Marketing 4 hours.
Formulation of conceptual and quantitative models which relate marketing activities and behaviors to other behaviors or sales or profits. Examines methods which researchers have used to test hypothesized marketing models.
Prerequisite(s): Admission to the PhD in Business Administration program.

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, and logistical issues.
Prerequisite(s): Admission to the PhD in Business Administration program.

587
Advanced Marketing Research 4 hours.
Multidimensional scaling, conjoint analysis including hybrid analysis, choice models including multinomial logit and probit models, selectivity models.
Prerequisite(s): Admission to the PhD in Business Administration program.

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.
Prerequisite(s): Admission to the PhD in Business Administration program 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(s): Admission to the PhD in Business Administration program.

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(s): MKTG 500.

596
Independent Study in Marketing 1 TO 4 hours.
Independent study under the direction of a faculty member. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Enrollment by petition to the director of the MBA program.

599
PhD Thesis Research 0 TO 16 hours.
Independent research on topic approved for the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Consent of the instructor.

Master of Business Administration (MBA)

500
Corporate Strategy 2 hours.
Analysis of major strategic decisions affecting the long-term performance of a firm and its ability to sustain competitive advantage. Meets eight weeks of the semester.
Prerequisite(s): Admission to the MBA Program.

570
Enterprise Decision Making 4 hours.
Provides content and frameworks to integrate prior course work to address business problems from a cross-functional and enterprise perspective.
Prerequisite(s): Completion of all other core courses in the MBA program. This course should be taken during the final semester in the program.

590
Professional Topics 2 TO 4 hours.
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. May be repeated to a maximum of 6 hours if topics vary. Students may register in more than one section per term.
Prerequisite(s): Admission to the MBA program.

591
Study Abroad—Master of Business Administration Program 0 TO 16 hours.
Lectures, seminars, and independent travel/study abroad in conjunction with admission to the MBA program. May be repeated to a maximum of 24 hours.
Prerequisite(s): Admission to the MBA program and consent of the director.

592
Master of Business Administration Project 8 hours.
Multidisciplinary team project at an outside company or university office. A written report and an oral presentation of the project is required.
Prerequisite(s): Admission to the MBA program and consent of the MBA program director.

594
Special Topics—Master of Business Administration Program 1 TO 4 hours.
An intensive study of a selected business topic not available in current course offerings. Subject matter will vary by section and semester. May be repeated to a maximum of 16 hours if topics vary. Students may register in more than one section per term.
Prerequisite(s): Admission to the MBA program.

596
Independent Study 0 TO 8 hours.
Independent study under the direction of a faculty member. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Enrollment by petition to the director of the MBA program.

Maternal-Child Nursing (NUMC)

502
Concepts for Pediatric/Perinatal Clinical Nurse Specialist Practice I 2 hours.
Students analyze theory and research related to the patient/family sphere of influence in order to design care for pediatric or perinatal patients and families.
Prerequisite(s): NUSC 500 and credit or concurrent registration in NUMC 520.

504
Concepts for Pediatric/Perinatal Clinical Nurse Specialist II 2 hours.
Students analyze theories and research related to pediatric or perinatal nursing personnel and organizational spheres of influence.
Prerequisite(s): NUMC 502 and credit or concurrent registration in NUMC 521.

507
Biological Basis for Women's Health and Perinatal Nursing I 2 hours.
Focuses on the anatomy and physiology of reproductive function, pregnancy, parturition, the puerperium, and menopause as the biological basis for women's health and perinatal nursing.
Same as NUWH 507.
Prerequisite(s): Consent of the instructor.

508
Biological 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 the biological basis for women's health and perinatal nursing.
Prerequisite(s): NUMC 507 or NUWH 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(s): 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 healthcare settings.

Prerequisite(s): Credit or concurrent registration in NUSC 530 and credit or concurrent registration in NUSC 531, or consent of the instructor.

**512
Practicum in Advanced
Pediatric Primary
Care I 1 TO 4 hours.**

Emphasizes clinical experiences in prevention, health promotion, and maintenance through teaching, counseling, guidance, and support of children and their families. May be repeated. **Prerequisite(s):** Credit or concurrent registration in NUMC 510 and credit or concurrent registration in NUSC 532, or consent of the instructor.

**513
Practicum in Advanced
Pediatric Primary
Care II 1 TO 4 hours.**

Emphasizes clinical experiences and management of acute episodic and stable chronic illnesses commonly encountered in pediatric ambulatory healthcare settings. May be repeated.

Prerequisite(s): Credit or concurrent registration in NUMC 512 or consent of the instructor.

**514
Practicum in Advanced
Pediatric Primary
Care III 1 TO 4 hours.**

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 healthcare settings. May be repeated.

Prerequisite(s): Credit or concurrent registration 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(s):** NUMC 508 or consent of the instructor.

**517
Healthcare of
Women I 4 hours.**

Healthcare of women through the life span with an emphasis on health promotion and disease prevention, fertility control, and preg-

nancy care. **Same as** NUWH 517.

Prerequisite(s): Credit or concurrent registration in NUMC 507 or credit or concurrent registration in NUWH 507, and credit or concurrent registration in NUSC 532, or consent of the instructor.

**518
Healthcare of
Women II 4 hours.**

Healthcare of women through the life span with an emphasis on the parturition, the puerperium, and common health and pregnancy problems. **Same as** NUWH 518.

Prerequisite(s): NUMC 508; and NUMC 517 or NUWH 517, or consent of the instructor.

**519
Healthcare of
Women III 4 hours.**

Healthcare of women through the life span with an emphasis on gynecologic and primary care.

Same as NUWH 519.
Prerequisite(s): NUMC 518 or NUWH 518; and NUSC 531 and NUSC 532 and NUSC 535.

**520
Pediatric and
Perinatal Clinical
Nurse Specialist
Practicum I 3 hours.**

The application of advanced knowledge of theory and research to care for pediatric and perinatal patients and families who require the care of a clinical nurse specialist. **Prerequisite(s):** NUSC 500 and NUSC 531 and NUSC 532 and NUMC 515 and credit or concurrent registration in NUMC 502.

**521
Pediatric and
Perinatal Clinical
Nurse Specialist
Practicum II 4 hours.**

The application of theory and research related to pediatric and perinatal nursing personnel and the healthcare organization; systematic assessment for problem identification and outcome evaluation. **Prerequisite(s):** NUMC 520 and NUMC 504.

**522
Pediatric and Perinatal
Clinical Nurse
Specialist III 5 hours.**

The application of theory and research for expansion of professional role competencies related to pediatric and perinatal nursing personnel and the healthcare organization. **Prerequisite(s):** Credit or concurrent registration in NUMC 521.

**524
Dimensions of Midwifery
and Women's Health
Practice 3 hours.**

Examines the complex functions and roles of women's healthcare providers. **Prerequisite(s):** NUMC 519 and NUMC 525 and NUSC 528 and NUSC 529.

**525
Practicum:
Healthcare of
Women 1 TO 8 hours.**

Clinical experiences to develop nurse-midwifery and nurse practitioner competencies in the healthcare of women. May be repeated. **Prerequisite(s):** NUMC 517 and NUSC 531 and NUSC 532.

**528
Practicum:
Birth and the
Newborn 1 TO 8 hours.**

Clinical experiences to develop beginning competence in the nurse-midwifery care of women and their newborns during parturition. May be repeated.

Prerequisite(s): NUMC 518 and NUSC 531 and NUSC 532.

**Mathematical
Computer
Science (MCS)****401
Computer
Algorithms I 3 OR 4 hours.**

Design and analysis of computer algorithms. Divide-and-conquer, dynamic programming, greedy method, backtracking. Algorithms for sorting, searching, graph computations, pattern matching, and NP-complete problems. **Same as** CS 401. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 360 and grade of C or better in STAT 381; or grade of C or better in CS 202.

**411
Compiler
Design 3 OR 4 hours.**

Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. **Same as** CS 473. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in CS 301 or grade of C or better in MCS 441; and grade of C or better in CS 202 or grade of C or better in MCS 360; and grade of C or better in CS 266.

**415
Programming
Language
Design 3 OR 4 hours.**

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. **Same as** CS 476. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): MCS 360 or CS 340.

**421
Combinatorics 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 261 or grade of C or better in CS 202; and grade of C or better in MATH 310 or grade of C or better in MATH 320 or grade of C or better in MATH 330.

**423
Graph Theory 3 OR 4 hours.**

Basic concepts of graph theory, including Eulerian and hamiltonian cycles, trees, colorings, connectivity, shortest paths, minimum spanning trees, network flows, bipartite matching, planar graphs. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 261 or grade of C or better in CS 202; and grade of C or better in MATH 310 or grade of C or better in MATH 320 or grade of C or better in MATH 330.

**425
Codes and
Cryptography 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 261 or grade of C or better in CS 202; and grade of C or better in MATH 310 or grade of C or better in MATH 320 or grade of C or better in MATH 330.

**441
Theory of
Computation I 3 OR 4 hours.**

Introduction to formal languages; relations between grammars and



automata; elements of the theory of computable functions. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in CS 202 or grade of C or better in MCS 261.

451 Object-Oriented Programming in C++ 3 OR 4 hours.

C++ as an object-oriented language, classes and member functions, access control, class scope, constructors, destructors, overloading, conversions, streams, derived classes, polymorphism through virtual functions, templates, class libraries. 3 undergraduate hours. 4 graduate hours. Credit is not given for MCS 451 if the student has credit for CS 474. Extensive computer use required. **Prerequisite(s):** Grade of C or better in MCS 360 or the equivalent or consent of the instructor.

471 Numerical Analysis 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MCS 275 or grade of C or better in CS 102 or grade of C or better in CS 108; or consent of instructor.

472 Introduction to Industrial Math and Computation 3 OR 4 hours.

Technical writing and oral presentations in preparation for industrial projects. Topics include quality control, operations research, cost-benefit analysis, differential equations, using scientific software. Extensive computer use required. **Prerequisite(s):** Grade of C or better in MCS 471 or consent of the instructor.

Recommended background: Designed for students with a desire to explore mathematics via practical fieldwork.

481 Computational Geometry 3 OR 4 hours.

Algorithmic problems on sets of points, rectangles, intervals, arcs, chords, polygons. Counting, reporting, location, intersection, pairing; static and dynamic data structures. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in MCS 401 or consent of the instructor.

494 Special Topics in Computer Science 3 OR 4 hours.

Topics in mathematical computer science, such as symbolic computation, automated reasoning, cryptography, or geometric algorithms. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

Prerequisite(s): Approval of the department.

496 Independent Study 1 TO 4 hours.

Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the instructor and the department.

501 Computer Algorithms II 4 hours.

Continuation of MCS 401 (Same as CS 401). Advanced topics in algorithms. Lower bounds. Union-find problems. Fast Fourier transform. Complexity of arithmetic, polynomial, and matrix calculations. Approximation algorithms. Parallel algorithms. **Same as** CS 501. **Prerequisite(s):** MCS 401 or CS 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.

Prerequisite(s): Grade of C or better in MCS 401 and grade of C or better in MCS 421.

504 Mathematics and Information Science for Industry Workshop 4 hours.

A project-based course on one or more topics in applied mathematics, statistics, or computer science, motivated by industrial problems. The topics vary from year to year. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Grade of B or better in MCS 401 and grade of B or better in MCS 471 and grade of B or better in MCS 507.

507 Mathematical, Statistical, and Scientific Software 4 hours.

The design, analysis, and use of mathematical, statistical, and scientific software.

Prerequisite(s): Grade of B or better in MCS 360 or the equivalent or consent of instructor.

521 Combinatorial Optimization 4 hours.

Combinatorial optimization: network flows, bipartite matching, Edmonds algorithm for nonbipartite matching, the matching polytope, matroids, greedy algorithm, matroid union and intersection algorithms, matroid polyhedra, polymatroids. **Prerequisite(s):** 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. **Prerequisite(s):** Grade of C or better in MCS 261, and grade of C or better in MATH 310 or grade of C or better in 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(s): Consent of the instructor.

548 Mathematical Theory of Artificial Intelligence 4 hours.

Valiant's learning model, positive and negative results in learnability, automation inference, perceptrons, Rosenblatt's theorem, convergence theorem, threshold circuits, inductive inference of programs, grammars and automata.

Prerequisite(s): MCS 541.

551 Generic Programming and the C++ Standard Template Library 4 hours.

Generic programming in C++. Templates, namespaces, smart pointers, reference counting. Algorithms, ranges, concepts, and modeling.

Iterators, function objects, adaptors, and containers. Algorithms and container classes in the STL. Extensive computer use required.

Prerequisite(s): Grade of C or better in MCS 451 or grade of C or better in an equivalent course in C++.

563 Analytic Symbolic Computation 4 hours.

Analytic computation, including integration algorithms, differential equations, perturbation theory, mixed symbolic-numeric algorithms, and other related topics.

Prerequisite(s): 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, axiomatizations, queries and query optimization, null values, algebraic interpretations.

571 Numerical Methods for Partial Differential Equations 4 hours.

Finite difference methods for parabolic, elliptic and hyperbolic differential equations: explicit, Crank-Nicolson implicit, alternating directions implicit, Jacobi, Gauss-Seidel, successive over-relaxation, conjugate gradient, Lax-Wendroff, Fourier stability.

Prerequisite(s): 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.

Prerequisite(s): MCS 471 or MCS 571 or consent of the instructor.

575 Computer Performance Evaluation 4 hours.

Modeling of computer systems, basic queues, central server models, Little's Law, operational analysis, Markovian networks, Jackson and BCMP networks, product form solutions, computational algorithms, mean value analysis, approximation methods.

Prerequisite(s): STAT 401 and MCS 412 or consent of the instructor.

590 Advanced Topics in Computer Science 4 hours.

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. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the department.



591
Advanced Topics in Combinatorial Theory 4 hours.
Some of the following topics: combinatorial enumeration, designs, graph theory, matroid theory, combinatorial matrix theory, Ramsey theory. Contents vary from year to year. May be repeated. **Prerequisite(s):** 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. **Prerequisite(s):** MCS 531 or consent of the instructor.

593
Graduate Student Seminar 1 hour.
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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

595
Graduate Seminar 1 hour.
Current developments in research with presentations by faculty, students, and visitors. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

596
Independent Study 1 TO 4 hours.
Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the instructor and the department.

597
MISI Master's Project 2 TO 4 hours.
Specialized project under close faculty supervision to satisfy the project requirement for the MS in Mathematics and Information Science for Industry degree. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 4 hours. **Prerequisite(s):** MCS 504 and approval of the department.

598
Master's Thesis 0 TO 16 hours.
Research work under the supervision of a faculty member leading to the completion of a master's thesis. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Approval of the department.

599
Thesis Research 0 TO 16 hours.
Research work under the supervision of a faculty member leading to the completion of a doctoral thesis. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

Mathematics (MATH)

410
Advanced Calculus I 3 OR 4 hours.
Functions of several variables, differentials, theorems of partial differentiation. Calculus of vector fields, line and surface integrals, conservative fields, Stokes' and divergence theorems. Cartesian tensors. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 210.

411
Advanced Calculus II 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 410.

414
Analysis II 3 OR 4 hours.
Sequences and series of functions. Uniform convergence. Taylor's theorem. Topology of metric spaces, with emphasis on the real numbers. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 313.

417
Complex Analysis with Applications 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade C or better in MATH 210.

419
Models in Applied Mathematics 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 220 and grade of C or better in MCS 260.

425
Linear Algebra II 3 OR 4 hours.
Canonical forms of a linear transformation, inner product spaces, spectral theorem, principal axis theorem, quadratic forms, special topics such as linear programming. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 320.

430
Formal Logic I 3 OR 4 hours.
First order logic, syntax and semantics, completeness-incompleteness. 3 undergraduate hours. 4 graduate hours. Credit is not given for MATH 430 if the student has credit for PHIL 416. **Prerequisite(s):** Grade of C or better in CS 202 or grade of C or better in MCS 261 or grade of C or better in MATH 215.

431
Abstract Algebra II 3 OR 4 hours.
Further topics in abstract algebra: Sylow Theorems, Galois Theory, finitely generated modules over a principal ideal domain. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 320 and grade of C or better in MATH 330.

435
Foundations of Number Theory 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 215.

436
Number Theory for Applications 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 435.

442
Differential Geometry of Curves and Surfaces 3 OR 4 hours.
Frenet formulas, isoperimetric inequality, local theory of surfaces, Gaussian and mean curvature, geodesics, parallelism, and the Gauss-Bonnet theorem. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 320.

445
Introduction to Topology I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 313.

446
Introduction to Topology II 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 445.

480
Applied Differential Equations 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 220.

481
Applied Partial Differential Equations 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 220.

494
Special Topics in Mathematics 3 OR 4 hours.
Course content is announced prior to each term in which it is given. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

496 Independent Study 1 TO 4 hours.
Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the instructor and the department.

502 Metamathematics I 4 hours.
First order logic, completeness theorem, and model theory. **Same as** PHIL 562. **Prerequisite(s):** MATH 430 or consent of the instructor.

503 Metamathematics II 4 hours.
Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. **Same as** PHIL 563. **Prerequisite(s):** MATH 502 or PHIL 562.

504 Set Theory I 4 hours.
Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. **Same as** PHIL 565. **Prerequisite(s):** MATH 430 or MATH 502 or PHIL 562.

506 Model Theory I 4 hours.
Introduction to stability theory: categoricity, stability, forking, finite equivalence relation theorem, indiscernibles, orthogonality. **Same as** PHIL 567. **Prerequisite(s):** MATH 502 or PHIL 562.

507 Model Theory II 4 hours.
Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. **Same as** PHIL 568. **Prerequisite(s):** MATH 506 or PHIL 567.

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. **Prerequisite(s):** MATH 330 and MATH 425.

510 Universal Algebra II 4 hours.
Discriminable and directly representable varieties, ultraproducts and quasivarieties, finitely based equational theories, commutator and center. **Prerequisite(s):** MATH 509.

512 Advanced Topics in Logic 4 hours.
Advanced topics in modern logic; e.g., descriptive set theory, model

theory of fields, theory of hierarchies, stable groups. **Same as** PHIL 569. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

513 Advanced Topics in Universal Algebra and Lattice Theory 4 hours.
Special topics. May be repeated. Students may register in more than one section per term.
Prerequisite(s): 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(s): 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.
Prerequisite(s): MATH 330 and MATH 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(s):** 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.
Prerequisite(s): MATH 517.

519 Algebraic Groups 4 hours.
Classical groups as examples; necessary results from algebraic geometry; structure and classification of semisimple algebraic groups.
Prerequisite(s): MATH 517.

531 Advanced Topics in Algebra 4 hours.
Research level topics, such as groups and geometries, equivalencies of module categories, representations of Lie-type groups. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

533 Real Analysis I 4 hours.
Introduction to real analysis. Lebesgue measure and integration, differentiation, L-p classes, abstract integration. **Prerequisite(s):** MATH 411 or MATH 414 or the equivalent.

534 Real Analysis II 4 hours.
Continuation of MATH 533.
Prerequisite(s): MATH 417.

535 Complex Analysis I 4 hours.
Analytic functions as mappings. Cauchy theory. Power Series. Partial fractions. Infinite products.
Prerequisite(s): MATH 411 or MATH 427.

536 Complex Analysis II 4 hours.
Normal families, Riemann mapping theorem. Analytic continuation, Harmonic and subharmonic functions, Picard theorem, selected topics. **Prerequisite(s):** 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.
Prerequisite(s): MATH 533; and MATH 417 or MATH 535.

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(s): MATH 533.

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(s): MATH 417.

542 Partial Differential Equations II 4 hours.
Cauchy problem for hyperbolic equations. Propagation of singularities. Boundary value problems for elliptic equations. **Prerequisite(s):** MATH 541.

546 Advanced Topics in Analysis 4 hours.
Subject may vary from semester to semester. Topics include partial differential equations, several complex variables, harmonic analysis and ergodic theory. May be repeated. Students may register in more than one section per term.
Prerequisite(s): 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. **Prerequisite(s):** MATH 330 and MATH 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(s): 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(s): MATH 445.

550 Differentiable Manifolds II 4 hours.
Vector bundles and classifying spaces, Lie groups and Lie algebras, tensors, Hodge theory, Poincaré duality. Topics from elliptic operators, Morse theory, cobordism theory, deRham theory, characteristic classes. **Prerequisite(s):** 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.
Prerequisite(s): MATH 442 and MATH 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(s): 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.

Prerequisite(s): MATH 517 and MATH 535.

555 Complex Manifolds II 4 hours.
Dolbeault Cohomology, Serre duality, Hodge theory, Kodaira vanishing and embedding theorem, Lefschitz theorem, Complex Tori, Kähler manifolds. **Prerequisite(s):** MATH 517 and MATH 535.

568 Topics in Algebraic Topology 4 hours.
Homotopy groups and fibrations. The Serre spectral sequence and its applications. Classifying spaces of classical groups. Characteristic classes of vector bundles. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** Approval of the department.

570 Advanced Topics in Differential Geometry 4 hours.
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. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

571 Advanced Topics in Algebraic Geometry 4 hours.
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. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

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(s):** MATH 411 or MATH 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(s):** MATH 411 and MATH 417 and MATH 481; or consent of 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. **Prerequisite(s):** MATH 320 and MATH 417 and MATH 481; or consent of 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. **Prerequisite(s):** MATH 410 and MATH 417 and MATH 481.

578 Asymptotic Methods 4 hours.
Asymptotic series, Laplace's method, stationary phase, steepest descent method, Stokes phenomena, uniform expansions, multi-dimensional Laplace integrals, Euler-MacLaurin formula, irregular singular points, WKBJ method.

Prerequisite(s): MATH 417 and MATH 481; or consent of instructor.

579 Singular Perturbations 4 hours.
Algebraic and transcendental equations, regular perturbation expansions of differential equations, matched asymptotic expansions, boundary layer theory, Poincaré-Lindstedt, multiple scales, bifurcation theory, homogenization.

Prerequisite(s): MATH 481 or consent of the instructor.

580 Mathematics of Fluid Mechanics 4 hours.
Development of concepts and techniques used in mathematical models of fluid motions. Euler and Navier-Stokes equations. Vorticity and vortex motion. Waves and instabilities. Viscous fluids and boundary layers. Asymptotic methods.

Prerequisite(s): Grade of C or better in MATH 410 and grade of C or better in MATH 417 and grade of C or better in MATH 481.

581 Special Topics in Fluid Mechanics 4 hours.
Geophysical fluids with applications to oceanography and meteorology, astrophysical fluids, magnetohydrodynamics and plasmas.

Prerequisite(s): Grade of C or better in 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.

Prerequisite(s): MATH 417 and MATH 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(s):** MATH 582.

584 Applied Stochastic Models 4 hours.
Applications of stochastic models in chemistry, physics, biology, queuing, filtering, and stochastic control, diffusion approximations, Brownian motion, stochastic calculus, stochastically perturbed dynamical systems, first passage times.

Prerequisite(s): MATH 417 and MATH 481 and STAT 401, or consent of the instructor.

586 Computational Finance 4 hours.
Introduction to the mathematics of financial derivatives; options, asset price random walks, Black-Scholes model; partial differential techniques for option valuation, binomial models, numerical methods; exotic options, interest-rate derivatives.

Prerequisite(s): Grade of C or better in MATH 220 and grade of C or better in STAT 381; or consent of the instructor.

589 Teaching and Presentation of Mathematics 2 hours.
Strategies and techniques for effective teaching in college and for mathematical consulting. Observation and evaluation, classroom management, presenting mathematics in multidisciplinary research teams. Required for teaching assistants in MSCS. No graduation credit awarded for students enrolled in the Master of Science in the Teaching of Mathematics degree program.

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(s):** 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(s):** Enrollment in the 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(s):** Enrollment in the Doctor of Arts program in mathematics or consent of instructor.





593 Graduate Student Seminar 1 hour.
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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

594 Internship in Mathematics 0 TO 8 hours.
Under the direction of a faculty adviser, students work in government or industry on problems related to their major field of interest. At the end of internship, the student must present a seminar on the internship experiences. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours. Only 4 credit hours count toward the 32 credit hours required for the MS in MISI degree. Does not count toward the 12 credit hours of 500-level courses requirement. **Prerequisite(s):** Completion of the core courses in the degree program in which the student is enrolled and approval of the internship program by the graduate adviser and the graduate studies committee.

595 Research Seminar 1 hour.
Current developments in research with presentations by faculty, students, and visitors. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

596 Independent Study 1 TO 4 hours.
Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the instructor and the department.

598 Master's Thesis 0 TO 16 hours.
Research work under the supervision of a faculty member leading to the completion of a master's thesis. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Approval of the department.

599 Thesis Research 0 TO 16 hours.
Research work under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

Mathematics Teaching (MTHT)

400 Methods of Teaching Secondary Mathematics I 3 OR 4 hours.
Philosophies, issues, techniques, and styles of teaching high school mathematics. Implications of psychological models. Mathematics in the evolving curriculum. Preparation of lessons. 3 undergraduate hours. 4 graduate hours. To be taken in the year prior to student teaching.
Prerequisite(s): Grade of C or better in MTHT 410, enrollment in BS or MS in the Teaching of Mathematics program in Secondary Mathematics Education, and a 2.50 grade point average in mathematics courses at the level of calculus or above.

401 Methods of Teaching Secondary Mathematics II 3 OR 4 hours.
Philosophies, issues, techniques, and styles of teaching high school mathematics. Preparation of diverse lessons. Supervised teaching experience. 3 undergraduate hours. 4 graduate hours. To be taken in year prior to student teaching.
Prerequisite(s): Grade of C or better in MATH 210 and enrollment in the BS or MS in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above.

410 Advanced Euclidean Geometry I 3 OR 4 hours.
A transformational approach to the geometry of the Euclidean plane is developed through the use of specific activities. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): Grade of C or better in MATH 210.

411 Advanced Euclidean Geometry II 3 OR 4 hours.
Axioms for Euclidean geometry are developed based upon reflections. Further concepts in Euclidean geometry which arise from these axioms are explored. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in MTHT 410.

420 Computers in Secondary School Mathematics 3 OR 4 hours.
An overview of techniques, topics and tools for teaching secondary-level mathematics using computers. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 210.

430 Mathematical Analysis for Teachers I 4 hours.
Basic properties of numbers, functions, graphs, limits, continuity, completeness of the system of real numbers. **Prerequisite(s):** Grade of C or better in MATH 210 or consent of the instructor.

435 Abstract Algebra 3 OR 4 hours.
Sets, properties of integers, groups, rings, fields. 3 undergraduate hours. 4 graduate hours. For students in the Master of Science in the Teaching of Mathematics program only. Other students enroll in MATH 330. **Prerequisite(s):** Grade of C or better in MATH 210 and enrollment in the MS in the Teaching of Mathematics program.

438 Educational Practice with Seminar I 6 hours.
The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** 2.50 grade point average in mathematics courses at the level of calculus or above, successful completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

439 Educational Practice with Seminar II 6 hours.
The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Credit or concurrent registration in MTHT 438; and approval of the department and a 2.50 grade point average in mathematics courses at the level of calculus or above and successful completion of 100-clock hours of pre-student teaching field experiences.

450 Concepts in Elementary School Mathematics I 3 OR 4 hours.
Advanced analysis of concept development and teaching methods. Sorting, classifying, counting, number tracks, addition, subtraction, group, place value, length, area, and alternative teaching strategies. 3 undergraduate hours. 4 graduate hours. For elementary school teachers.

Prerequisite(s): Graduate standing and admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

460 Geometric Measurement and Numerical Methods 3 OR 4 hours.
Classical problems of length, area, and volume, including numerical trigonometry are explored using a scientific calculator. 3 undergraduate hours. 4 graduate hours. Do not purchase a calculator for the course until after the first day of class.
Prerequisite(s): Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

465 Teaching Algebra for Understanding 3 OR 4 hours.
Manipulatives and other representations of mathematical concepts used for teaching algebra to middle grade students. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

466 Introduction to Calculus and the Graphing Calculator 4 hours.
Problem solving using derivatives, differentials, and their applications followed by integrals and their applications. Maximum/minimum problems solved directly by graphing, then by derivatives.

Prerequisite(s): 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(s):** 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(s):** Admission to the Mathematics Education Concentrators Program or consent of the instructor.

470
Teaching Mathematics with Science: An Activity Approach I 3 OR 4 hours.

Introduction to basic variables (length, area, volume, mass, time) and the Scientific Method (picture, table, graph, questions). Extensive use of TIMS project curriculum. 3 undergraduate hours. 4 graduate hours. For elementary school teachers. **Prerequisite(s):** Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

480
Microcomputers in Elementary School Mathematics I 3 OR 4 hours.

Introduction to microcomputers and their use in elementary school mathematics. Basic microcomputer functions, educational software programs, pedagogical and curricular implications, and implementation questions. 3 undergraduate hours. 4 graduate hours. For elementary school teachers. **Prerequisite(s):** Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

490
Topics in Teaching Secondary Mathematics 1 TO 5 hours.

Course content is announced prior to each term in which it is given. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Prerequisites may vary according to topic.

491
Topics in Teaching Elementary/Junior High School Mathematics 1 TO 5 hours.

Course content is announced prior to each term in which it is given. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Prerequisites may vary according to topic.

496
Independent Study 1 TO 4 hours.

Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the instructor and the department.

510
Introduction to Higher Geometry 4 hours.

Projective geometry, as an extension of Euclidean geometry, treated synthetically and/or algebraically. Desargues' and Pappus' theorems, subgeometries, conics and the underlying skew field. For graduate students in mathematics teacher education programs. Other students enroll in MATH 440.

Prerequisite(s): Grade of C or better in MATH 330.

530
Mathematical Analysis for Teachers II 4 hours.

Derivatives, inverse functions, Riemann integral, trigonometric functions, logarithmic and exponential functions. **Prerequisite(s):** Grade of C or better in MTHT 430 or consent of the instructor.

550
Concepts and Methods in Elementary School Mathematics II 4 hours.

Methods of teaching middle school mathematics: concept development; focus on classroom materials to promote learning. Area, volume, rational numbers, decimals, function machines. **Prerequisite(s):** MTHT 450 or consent of the instructor.

560
Introduction to Analytic Geometry and Calculus 4 hours.

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. For elementary school teachers. Do not purchase a calculator until after the first day of class. **Prerequisite(s):** 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(s): Enrollment in the MS in the Teaching of Mathematics

program (Option for Elementary School Teachers) or consent of the instructor.

575
Principles of Probability and Statistics 4 hours.

Probability, descriptive and inferential statistics, implications for teaching. Emphasis on collection and analysis of data, classroom activities and software. For elementary school teachers. **Prerequisite(s):** Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) or approval of the department.

589
Practicum in Teaching Elementary School Mathematics 4 hours.

Culminating experience for students in the MS in the Teaching of Mathematics (Option for Elementary School Teachers). Major project is required. Supervised weekly seminars. **Prerequisite(s):** Admission to the MS in the Teaching of Mathematics program (Option for Elementary School Teachers) and consent of the instructor.

590
Topics in Teaching Secondary Mathematics 1 TO 5 hours.

Course content is announced prior to each term in which it is given. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Prerequisite may vary according to topic.

591
Topics in Teaching Elementary/Junior High School Mathematics 1 TO 5 hours.

Course content is announced prior to each term in which it is given. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Prerequisite may vary according to topic.

592
Topics in Advanced Mathematics for Teachers 1 TO 5 hours.

Course content is announced prior to each term in which it is given. May be repeated. Students may register in more than one section per term. For students in the MS in the Teaching of Mathematics program. **Prerequisite(s):** Prerequisite may vary according to topic.

596
Independent Study 1 TO 4 hours.

Reading course supervised by a faculty member. May be repeated. Students may register in more than

one section per term.

Prerequisite(s): Approval of the instructor and the department.

Mechanical Engineering (ME)

401
Applied Stress Analysis I 3 OR 4 hours.

Complex bending and torsion, curved flexural members, energy methods in design, theories of failure. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CME 203.

408
Intermediate Vibration Theory 3 OR 4 hours.

Free and forced vibrations of multi-degree of freedom linear systems. Lagrangian dynamics, matrix, approximate, and numerical methods. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 308.

409
Advanced Kinematics I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 320.

410
Automation and Robotics Applications 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 210.

411
Mechatronics I 0 TO 4 hours.

Elements of mechatronic systems, sensors, actuators, microcontrollers, modeling, hardware in the loop simulations, real-time software, Electromechanical systems laboratory experiments. **Same as** IE 411. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. **Prerequisite(s):** Senior standing or above; or approval of the department.

412
Dynamic Systems Analysis I 3 OR 4 hours.

Classical control theory, concept of feedback, laplace transform, transfer functions, control system characteristics, root locus, frequency response, compensator design. **Same as** IE 412. 3 undergraduate



hours. 4 graduate hours.
Prerequisite(s): ME 308.

**413
Dynamics of
Mechanical
Systems 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 320.

**414
Theory of
Gearing and
Applications 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 320.

**415
Propulsion
Theory 3 OR 4 hours.**

Thermodynamics and fluid mechanics of air-breathing engines, performance of rockets; chemical and nuclear rockets. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 419 or the equivalent.

**417
Intermediate Fluid
Mechanics 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 318.

**419
Compressible Flow
Theory 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 318.

**421
Intermediate
Heat Transfer 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 321 or consent of the instructor.

**422
Heating, Ventilation,
and Air
Conditioning 3 OR 4 hours.**

Refrigeration systems and heat-pump, mass transfer in humidification, solar heat transfer in buildings, heating and cooling loads, air-conditioning computer project. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 321.

**423
Heat
Exchangers 3 OR 4 hours.**

Classification; heat transfer and pressure drop analysis, flow distribution, transient performance, surface selection and geometrical properties, codes and standards. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 211 and ME 321.

**424
Energy Management
Solutions for Industry:
Theory and
Practice 3 OR 4 hours.**

Emphasis on real-world applications including: understanding utility billing and identifying costs; identifying and quantifying energy savings opportunities at industrial facilities; determining investment payback scenarios and considerations. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. Fieldwork required. Extensive use of Microsoft Excel. **Prerequisite(s):** Junior standing or above.

**425
Second Law
Analysis in Energy
Engineering 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 321.

**426
Applied
Combustion 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 325.

**427
Solar
Engineering 3 OR 4 hours.**

Applications; solar geometry and intensities; applied heat transfer topics; flat plate and concentrating collectors; energy storage; analysis of

heating and cooling systems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 321 or consent of the instructor.

**428
Numerical Methods in
Mechanical
Engineering 3 OR 4 hours.**

Introduction to numerical solution methods for problems in mechanical engineering. Example problems include heat transfer, fluid mechanics, thermodynamics, mechanical vibrations, dynamics, stress analysis, and other related problems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CS 108 and senior standing.

**429
Internal Combustion
Engines 3 OR 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 system. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ME 325.

**433
Nonequilibrium
Thermal
Processes 3 OR 4 hours.**

Molecular engineering. Nonequilibrium statistical mechanics. Distribution functions. Molecular excitation and de-excitation. Ionization and dissociation. Laser engineering. Nonequilibrium chemical kinetics. Surface processes. Chemisorption and physisorption. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): ME 325 or consent of the instructor.

**441
Optical Methods in
Mechanical
Engineering 0 TO 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Senior standing or consent of the instructor.

**444
Interdisciplinary Product
Development I 3 hours.**

Cross-functional teams (with students from AD 420/423 and MKTG 594) research and develop new product concepts. Focus on the identification of technologically appropriate product design problems. Yearlong (with ME 445) project course. **Prerequisite(s):** Senior standing or above; and consent of the instructor.

**445
Interdisciplinary
Product
Development 2 4 hours.**

Cross-functional teams (with students from AD 420 and MKTG 594) research and develop new product concepts. Focus on solutions to the opportunities identified in ME 444 to functional prototypes. Yearlong (with ME 444) project course.

Prerequisite(s): ME 444; and senior standing or above; and consent of the instructor.

**447
Introduction to
Computer-Aided
Design 0 TO 4 hours.**

Conventional and computer-assisted methods in design. Geometry manipulation. Computer-aided modeling with curves, surfaces, and solids. Design with finite-element analysis. PRO/Engineer and PRO/Mechanica. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): MATH 220 and ME 250.

**449
Microdevices and
Micromachining
Technology 0 TO 5 hours.**

Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Simulation experiments. Laboratory. **Same as** ECE 449. 4 undergraduate hours. 5 graduate hours. **Prerequisite(s):** ECE 347.

**450
Air Pollution
Engineering 4 hours.**

Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion.

Same as CHE 450.

Prerequisite(s): ME 321 or consent of the instructor.

**464
Virtual
Automation 3 OR 4 hours.**

Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing; industrial robots and automated factory models within virtual environments.

Same as IE 464. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): IE 201; and CS 107 or CS 108.

**468
Virtual
Manufacturing 3 OR 4 hours.**

Virtual reality applications in manufacturing systems design, manufacturing applications of networked



virtual reality, virtual reality modeling of occupational safety engineering. **Same as** IE 468. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): CS 107 or CS 108.

494

Special Topics in Mechanical

Engineering 3 OR 4 hours.

Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. 3 undergraduate hours. 4 graduate hours. May be repeated. **Prerequisite(s):** Consent of the instructor.

501

Advanced Thermodynamics 4 hours.

Thermodynamic laws of closed and open systems; energy destruction; property relations, single phase systems, Gibbs-Duhem relations, multi-phase systems, equilibrium; engineering applications. **Prerequisite(s):** 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(s):** ME 401.

504

Computer-Aided Analysis of Multibody Systems I 4 hours.

Kinematics, dynamics, analysis of flexible mechanisms. Constrained mechanical systems with flexible components. Numerical methods. Computer-aided analysis. Applications. **Prerequisite(s):** 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(s):** ME 504.

508

Engineering Acoustics 4 hours.

Fundamentals of acoustic energy generation, radiation, and transmission (both aerodynamically and structurally). Theoretical, experimental, and numerical techniques. Applications spanning from 1-D plane waves to more complex 3-D

problems. **Prerequisite(s):** ME 408 or CME 435; or approval of the department.

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(s):** ME 409.

510

Robotic Manipulators 4 hours.

Description of robotic manipulator; gripper trajectory execution; manipulator design, degree-of-freedom, mobility, workspace, special link positions; static and dynamic force transmission. **Prerequisite(s):** ME 409 or ME 410 or ME 413; or consent of the instructor.

511

Mechatronics II 4 hours.

Microcontrollers used in electro-mechanical systems for measurement and control purposes, interface hardware, real-time software and development tools, applications in robotic motion control and factory automation. **Same as** IE 511. **Prerequisite(s):** ME 411 and consent of the instructor.

512

Automatic Control of Mechanical Systems 4 hours.

Modeling and analysis of mechanical systems. Performance specification and evaluation. Modern control system design and analysis techniques. Real-time computer control of engines, manufacturing processes, biomechanical systems. **Prerequisite(s):** ME 412 or consent of the instructor.

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(s):** ME 417.

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. **Prerequisite(s):** ME 417 and ME 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(s):** 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(s):** 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(s):** 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(s):** ME 421.

528

Numerical Heat Transfer 4 hours.

Numerical methods for solving conduction, convection, and radiation problems in heat transfer. Iterative methods with shooting; local non-similarity methods perturbation methods; finite difference methods; grid generation. **Prerequisite(s):** CS 108 and ME 421 or consent of instructor.

529

Advanced Internal Combustion Engines 4 hours.

Fundamentals of internal combustion engines. Combustion in homogeneous charged and compression ignition engines. Emission formation. Effect of design and operating variables, control, and instrumentation. **Prerequisite(s):** ME 426 or ME 429.

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 absorption of radiation.

533

Plasma Engineering 4 hours.

Plasma-assisted applications. Kinetic theory of nonequilibrium processes. Plasma dynamics. Elementary processes-collisions. Diffusion and transport. Chemical reactions and surface treatment. Particle and energy balance in plasmas. **Prerequisite(s):** ME 433 or consent of the instructor.

535

Theory of Vibrations II 4 hours.

Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; floquet waves; nonlinear vibrations. **Same as** CME 535. **Prerequisite(s):** CME 435 or ME 408 or the equivalent.

536

Chemically Reacting Flows 4 hours.

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. **Prerequisite(s):** ME 516; and ME 514 or ME 522.

540

Design, Modeling, and Fabrication of Microsystems 4 hours.

MEMS design approach, materials and mechanical properties, scaling laws, transduction methods, micro-fabrication techniques, modeling and simulation strategies, dynamics, domain-specific details-structures, fluids, dissipation, and system issues. **Prerequisite(s):** Consent of the instructor.

541

Microelectronic Fabrication Techniques 4 hours.

Current fabrication techniques of microelectronic technology; plasma and CVD processes; etching techniques; ion implantation; surface analytical methods. **Same as** ECE 541. **Prerequisite(s):** ECE 347 or ECE 449.

542

Advanced Computational Methods for Product and Process Design 4 hours.

Deterministic and statistical methods for modeling and optimizing engineering systems, in the broad context of product design, manufacturing process development, and designing for life cycle





issues. **Same as** IE 542.

Prerequisite(s): Programming language experience.

**547
Advanced Concepts in
Computer-Aided
Engineering 4 hours.**

Useful concepts in motion simulation of complex rigid multibody systems. Interactive computer solutions. Recursive formulation of kinematical and dynamical equations of open and constrained multibody systems. **Prerequisite(s):** ME 413 and ME 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(s):** ME 447.

**569
Advanced Virtual
Manufacturing 4 hours.**

Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. **Same as** IE 569. **Prerequisite(s):** Consent of the instructor.

**594
Current Topics in
Mechanical
Engineering 4 hours.**

Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. May be repeated. **Prerequisite(s):** Consent of the instructor.

**595
Seminar on Mechanical
Engineering
Research 1 hour.**

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. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Graduate standing in mechanical engineering.

**596
Independent
Study 1 TO 4 hours.**

Individual study under close supervision of a faculty member. May be repeated to a maximum of 4 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

**598
MS Thesis
Research 0 TO 16 hours.**

Individual research in specialized problems under close faculty supervision. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

**599
PhD Thesis
Research 0 TO 16 hours.**

Individual research on specialized problems under close faculty supervision. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

**Medical
Biotechnology
(MBT)**

**500
DNA and Proteins 3 hours.**

DNA replication, transcription, translation, and posttranslational modifications. Genome structure. Viruses. Bioinformatics and microarrays. Protein structure. Enzyme mechanisms. Biochemical pathways, and regulation of biochemical pathways. **Recommended background:** Basic undergraduate general and organic chemistry, biology, physics, and math.

**501
Cell Biology and
Human Physiology 3 hours.**

Cellular organization and cell organelles; lipid membranes; the cytoskeleton; and cell interactions signaling and cycle control. Growth factors and neurochemistry. Mechanical and electrical phenomena. Synaptic transmission. Sensory and motor neurophysiology.

Recommended background: Basic undergraduate general and organic chemistry, biology, physics, and math.

**502
Immunotechnology,
Microbiology, and
Cellular Therapy 3 hours.**

Covers antibody production principles, clinical uses of antibodies, fermentation and bioremediation and protein production principles, cellular and stem cell therapies, bioterrorism control, containment and eradication. **Prerequisite(s):** MBT 500 and MBT 501.

**503
Pharmacology,
Toxicology, and
Clinical Trials 3 hours.**

Basic pharmacology, drug-receptor interactions. Basic toxicology. Drug development cycle (Preclinical work, Phase I, II, III). Design, implementation, and evaluation of clinical trials.

IRB issues. Ethical conduct of clinical trials. **Prerequisite(s):** MBT 500 and MBT 501.

**510
Ethics in Medical
Biotechnology 2 hours.**

Rationale for making ethical decisions, review of existing guidelines, considerations of the use of adult and embryonic stem cells, ethical issues on animal research, conflict of interest and misconduct in research and business. **Prerequisite(s):** MBT 500 and MBT 501 and MBT 502 and MBT 503; or consent of the instructor.

**513
Research Planning,
Design, and
Execution 1 hour.**

Presentation of the basics of planning, designing, and executing a research plan. Students prepare a project plan and defend the plan to a faculty panel and peers. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours.

**520
Biotechnology Product
Development: Concepts,
Practice, and
Regulatory Issues 2 hours.**

Product development and commercialization processes. Product life cycles, program management basics. Intellectual property. Regulatory affairs issues: GLP, product registration, GMP, documentation, validation, FDA inspections. **Prerequisite(s):** MBT 500 and MBT 501 and MBT 502 and MBT 503; or consent of the instructor.

**521
Techniques and
Processes in
Biotechnology 3 hours.**

Preparation and isolation of antibodies, basics of cell culture, recombinant DNA techniques, techniques of protein production and engineering and examples of cloning. Basics of GLP and practical experience in applications of GLP.

Prerequisite(s): MBT 500 and MBT 501. **Course Schedule Information:** To be properly registered, students must enroll in one discussion and one laboratory.

**522
Applied Medical
Biotechnology 2 hours.**

The principles and methodologies used in commercial lab assays will be analyzed and their strengths and weaknesses discussed. An array of hospital/clinical techniques will be reviewed via lecture/demonstration in typical application venue.

Prerequisite(s): MBT 500 and MBT 501 and MBT 520.

**523
Biotechnology
Engineering 2 hours.**

Engineering aspects of large-scale cell culture: methodologies, types of production equipment, process sensing and control, harvesting, separation and purification. Sterilization, aseptic processing, filling and finishing steps. QA/QC. Field trips required. **Prerequisite(s):** Completion of the first year of the MS in Medical Biotechnology program.

**591
Departmental
Seminar in Medical
Biotechnology 1 TO 4 hours.**

Lecture series by invited speaker or advanced students with lectures on topics of current or developing interest in medical biotechnology. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Approval of the department.

**595
Student Seminar in
Medical
Biotechnology 2 hours.**

Students write and present literature research/review papers on topics directly related to medical biotechnology. Satisfactory/Unsatisfactory grading only. May be repeated. Extensive computer use required. Coupled with departmental seminar.

**596
Independent
Study in Medical
Biotechnology 1 TO 4 hours.**

Independent and individual study of a topic in medical biotechnology. Usually involves extensive literature research culminating in a review paper or hypothesis/conclusion argument paper. May be repeated to a maximum of 4 hours if topics vary. Students may register in more than one section per term.

Prerequisite(s): Completion of the first year of the MS in Medical Biotechnology program, approval of the department, and approval of a faculty mentor. The student also should have completed core or elective courses in the degree sequence that introduce the topic of independent study or have verifiable outside knowledge.

**597
Master's Project
Research 0 TO 16 hours.**

A project-based internship at a biotechnology company or a research laboratory at the College of Medicine in Rockford. Students will gain on-the-job experience in designing and conducting experiments, evaluating results, and

reporting to supervisors. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Student should have approval of the graduate committee to commence research and the agreement of faculty and industrial mentors along with a written agreement for research activity from the host company.

**598
Master's Thesis
Research 0 TO 16 hours.**

Master's thesis research conducted at the College of Medicine in Rockford under faculty supervision. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Completion of the first year of the program and consent of the instructor.

Medical Education (MHPE)

**433
Principles of
Evidence-Based
Healthcare 2 hours.**

Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, comparing scientific papers as bases for healthcare education and practice. Same as BHIS 433.

Prerequisite(s): Graduate or professional standing and approval of the school.

**439
Writing for Scientific
Publication 2 hours.**

Instruction and workshop explores the process of fully preparing and submitting a manuscript to a health professions journal. Students must bring analyzed data set.

Prerequisite(s): Graduate or professional standing and consent of the instructor.

**441
Clinical
Decision Making 2 hours.**

Introduction to descriptive and normative theories of decision making; interpretation of diagnostic tests; measuring patient preferences; decision analysis and cost-effectiveness analysis; psychology of judgment and choice.

Prerequisite(s): Consent of the instructor.

**494
Special Topics in
Health Professions
Education 1 TO 4 hours.**

Selected topics of current interest in health professions education. May be repeated with approval. Students may register in more than one section per term. Approval to repeat course granted by the department.

Prerequisite(s): Prerequisites may vary by section, depending upon topic.

**501
Current Issues in
Health Professions
Education 4 hours.**

Examines how historical, social, policy, and organizational factors influence education in the health professions. **Prerequisite(s):** Graduate or professional standing and consent of the instructor.

**502
Instruction and
Assessment for
Health Professionals 4 hours.**

Methods and issues of effective instruction and assessment in health professions education are presented, including how effective instruction and assessment support student learning and faculty decisions. **Prerequisite(s):** Consent of the instructor.

**503
Curriculum Planning and
Program Evaluation
for Health
Professionals 4 hours.**

Methods and issues in planning and evaluating educational programs in the health professions are presented, including how institutional and social forces affect planning and evaluation. **Prerequisite(s):** Approval of the department.

**504
Organization and
Management of
Health Professions
Education Programs 4 hours.**

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.

**512
Ethics in Clinical
Research 1 hour.**

Survey of key ethical issues involved in conducting research with human subjects, including informed consent, confidentiality, access, and equity. Same as HPA 512.

Extensive computer use required. Requires completion of an online course in human subjects research to be supplemented by classroom discussion of the topics raised in that course and others.

Prerequisite(s): Approval of the department. Students must be enrolled in the Master of Science in Public Health program.

**534
Research Design
and Grant Writing 2 hours.**

Introduction to the skills necessary to plan a research project and write a research grant proposal using a systematic approach. Same as HPA 534. Previously listed as MHPE 431. **Prerequisite(s):** Graduate or professional standing; and approval of the department.

**535
Translating Research
into Practice 3 hours.**

Current theory and practical reality related to the adoption and use of new scientific findings in patient care. The influence of research on public policy. Same as HPA 535. Extensive computer use required. **Prerequisite(s):** Graduate or professional standing; and approval of the department.

**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.**

Selected problems or issues in health professions education are investigated under the direction of a committee of the student's choice. Satisfactory/Unsatisfactory grading only.

**598
Thesis
Research 0 TO 16 hours.**

Selected problems or issues in health professions education are investigated under the direction of a committee of the student's choice. Satisfactory/Unsatisfactory grading only.

Medical Humanities (MHUM)

**494
Special Topics in
Medical
Humanities 1 TO 4 hours.**

Presents special topics in selected aspects of medical humanities for health professionals. May be repeated with approval. Students may register in more than one section per term. Approval to repeat course granted by the department.

Prerequisite(s): Prerequisites may vary by section, depending upon topic.

**496
Independent
Study 1 TO 4 hours.**

Students may arrange with any of the faculty to do independent study on some aspect of communication, history literature, philosophy, or ethics as it relates to healthcare.

Medical Laboratory Sciences (MLS)

**527
Clinical Laboratory
Method Evaluation 3 hours.**

Development and comparison of clinical laboratory methods; also statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. Same as PATH 527.

Prerequisite(s): Consent of the instructor.

**560
Blood Groups: Systems
and Serology 3 hours.**

Focus on human blood group systems; biochemistry, inheritance, serologic activity, clinical significance, and disease association. Fundamentals of immunology, molecular biology, and genetics. Extensive computer use required.

Taught only online. A UIC netid is required. **Prerequisite(s):** General knowledge of immunohematology and consent of the instructor.

**561
Clinical
Immunohematology
and Transfusion 3 hours.**

Transfusion medicine practice and therapy. The human circulatory system, effects of hemorrhagic shock, component therapy, hematopoietic transplantation, complications of transfusion, standards, regulations, and compliance. Extensive computer use required. Taught only online. A UIC netid is required.

Prerequisite(s): MLS 560 and consent of the instructor.

**562
Principles and Methods
in Immuno-
hematology I 0 TO 4 hours.**

Theoretical and practical concepts used in blood procurement and product manufacturing. Blood donor suitability, collection, testing, component preparation, labeling, storage, quality management systems. Extensive computer use required.

Lecture-discussion taught only online. A UIC netid is required. Students who require a clinical rotation component register for 4 hours and participate in both laboratory and lecture-discussion; all others register for 3 hours and participate in lecture-discussion only.





Prerequisite(s): Credit or concurrent registration in MLS 560 and consent of the instructor.

563 Principles and Methods in Immunohematology II 0 TO 4 hours.

Theoretical and practical concepts used in the organization and management of blood centers and transfusion services. Introduction to laboratory financial management, cost accounting, coding, staffing, ethics, and legal issues. Extensive computer use required. Lecture-discussion taught only online. A UIC netid is required. Students who require a clinical rotation component register for 4 hours and participate in both clinical practice and lecture-discussion; all others register for 3 hours and participate in lecture-discussion only. **Prerequisite(s):** MLS 562 and credit or concurrent registration in MLS 561 and consent of the instructor.

564 Current Trends in Immuno-hematology 1 hour.

Advanced studies of current trends; assigned topics in current literature read, evaluated, and discussed. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours. Extensive computer use required. Taught only online. A UIC netid is required. **Prerequisite(s):** General knowledge of immunohematology and consent of the instructor.

594 Special Topics in Medical Laboratory Sciences 1 TO 3 hours.

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. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596 Independent Study 1 TO 4 hours.

For graduate students who wish to pursue independent study not related to their project/thesis research. May be repeated. Students may register in more than one section per term.

597 Project Research in Medical Laboratory Sciences 0 TO 5 hours.

Independent investigation that engenders the responsibilities of professionals to contribute to their

field. Students investigate a topic/problem in their field, write an article, and deliver an oral presentation. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

598 Research in Medical Laboratory Sciences 0 TO 16 hours.

Independent research in one area of medical laboratory sciences directed by a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Foundation courses in research methods such as AHS 510, and statistics, or consent of the instructor.

Medical-Surgical Nursing (NUMS)

530 Nursing Management of Acutely Ill Patients I 3 hours.

Advanced practice in medical-surgical nursing. Emphasizes pathophysiology, etiologies, clinical evaluation, and management of adults with common health problems in acute care. **Prerequisite(s):** Credit or concurrent registration in NUSC 530 and credit or concurrent registration in NUSC 531 and credit or concurrent registration in NUSC 532.

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. **Prerequisite(s):** NUMS 530. Requires concurrent registration in NUSC 533.

533 Acute Care Clinical Nurse Specialist Practicum I 3 TO 5 hours.

First in a series of three practicum courses emphasizing the core competencies of the acute care clinical nurse specialist. May be repeated. **Prerequisite(s):** NUMS 530.

534 Acute Care Nurse Practitioner Practicum I 4 TO 6 hours.

Practicum emphasizing the clinical evaluation, symptom management, education, and case management of adults with common health problems in acute care. May be repeated. **Prerequisite(s):** Credit or concurrent registration in NUMS 530.

535 Acute Care Clinical Nurse Specialist Practicum II 3 TO 5 hours.

Second in a series of three practicum courses emphasizing the core competencies of the acute care clinical nurse specialist. May be repeated. **Prerequisite(s):** NUMS 533.

536 Acute Care Nurse Practitioner Practicum II 4 TO 6 hours.

Practicum emphasizing the clinical evaluation, symptom management, education and case management of acutely ill adults. May be repeated. **Prerequisite(s):** Credit or concurrent registration in NUMS 532 and credit or concurrent registration in NUMS 534.

537 Acute Care Clinical Nurse Specialist Practicum III 3 TO 6 hours.

Third in a series of three practicum courses emphasizing the core competencies of the acute care clinical nurse specialist. May be repeated. **Prerequisite(s):** NUMS 535.

538 Acute Care Nurse Practitioner Practicum III 4 TO 6 hours.

Practicum emphasizing the comprehensive clinical evaluation and management of adults with complex health problems in acute care. May be repeated. **Prerequisite(s):** NUMS 536.

540 Pathophysiological Basis of Disease 3 hours.

Provides a foundation for clinical therapeutics through an understanding of mechanisms of disease. Basic concepts of pathological processes at the cellular and molecular and systems level are examined with application of clinical disease in adults. **Prerequisite(s):** NUSC 530; or the equivalent or consent of the instructor.

544 Management of Adult Health Problems Practicum 4 hours.

Preparation for advanced practice evaluation and management of acute, episodic, and chronic care of adult health problems in the primary care setting. **Prerequisite(s):** NUSC 530 and NUMS 530 and NUMS 560 and NUMS 540 and NUSC 532 and NUMS 534.

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(s): NUSC 525 or the equivalent or consent of the instructor.

546 Multivariate Analysis for Health Sciences 3 hours.

Practical applications of multivariate techniques in health sciences. Minimal involvement in mathematics provided one has basic understanding of multivariate analysis. **Prerequisite(s):** NUMS 545.

548 Management of Chronic and Complex Adult Health Problems Practicum 4 hours.

Preparation for advanced practice evaluation and management of chronic and complex care of adult health problems. **Prerequisite(s):** NUMS 544.

549 Laboratory Techniques for Nursing Research 3 hours.

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. Animals used in instruction. **Prerequisite(s):** NUSC 530.

550 Common Geriatric Health Problems 3 hours.

Advanced practice in geriatric nursing. Emphasizes pathophysiology, etiologies, clinical evaluation, and management of common and uncomplicated problems for older adults. **Prerequisite(s):** NUSC 530 and NUSC 531 and NUSC 532.

552 Management of Complex Geriatric Health Problems 3 hours.

Advanced practice in geriatric nursing. Emphasizes pathophysiology, etiologies, clinical evaluation, and management of complex health problems in older adults.

Prerequisite(s): Credit or concurrent registration in NUMS 553 or credit or concurrent registration in NUMS 554.

553 GCNS Practicum I: Common Geriatric Health Problems 3 TO 5 hours.

First in a series of three practicum courses emphasizing clinical practice, education, research, and consultation related to care of older adults with common health problems. May be repeated.

Prerequisite(s): NUMS 550.



554
GNP Practicum I: Management of Common Health Problems 4 hours.
 Practicum emphasizing clinical evaluation, health promotion, differential diagnosis, symptom management, education, and case management of older adults with common uncomplicated health problems.
Prerequisite(s): NUMS 550.

555
GCNS Practicum II: Complex Geriatric Health Problems 0 TO 5 hours.
 Second in a series of three practicum courses emphasizing clinical practice, education, research, and consultation related to the care of older adults with acute and chronic conditions. Students register for 3 to 5 credit hours. May be repeated. **Prerequisite(s):** NUMS 550 and NUMS 553.

556
GNP Practicum II: Older Adults with Complex Health Problems 4 hours.
 Practicum emphasizing clinical evaluation, differential diagnosis, symptom management, education and case management of older adults with complex health problems.
Prerequisite(s): NUMS 544 or NUMS 554.

557
GCNS Practicum III: Integrative Practice 3 TO 6 hours.
 Third in a series of three practicum courses emphasizing clinical practice, education, research, and consultation related to care of older adults. May be repeated.
Prerequisite(s): NUMS 555.

558
GNP Practicum III: Integrative Practice 4 hours.
 Practicum emphasizing clinical evaluation, health promotion, differential diagnosis, and comprehensive case management of older adults with common and complicated health problems. **Prerequisite(s):** NUMS 556.

560
Primary Care of Adults 3 hours.
 Focuses on wellness care as well as acute, episodic, and chronic care of older adolescent and adult health problems. **Prerequisite(s):** Credit or concurrent registration in NUSC 530 and credit or concurrent registration in NUSC 531 and credit or concurrent registration in NUSC 532 and credit or concurrent registration in NUMS 540.

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(s):** Consent of the instructor.

570
Common Adult and Geriatric Health Problems 3 hours.
 Advanced practice in adult and geriatric. Emphasizes clinical evaluation and management of common and uncomplicated problems in adults and older adults. **Prerequisite(s):** Credit or concurrent registration in NUMS 560.

Medicinal Chemistry (MDCH)

412
Pharmaceutical Applications of Genomics and Bioinformatics 2 hours.
 Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. **Same as** PMMP 412. **Prerequisite(s):** PHAR 331 or consent of the instructor. For graduate students: one or two semesters of basic molecular biology and/or biochemistry with a grade of B or better.

507
Drug Discovery, Design, and Development 3 hours.
 Overview of drug development process from target identification and screening through clinical trials and FDA evaluation. **Same as** BPS 507 and PMPG 507.

516
Structure Elucidation of Natural Products II 3 hours.
 Employing modern computational methods in the structure elucidation and dereplication of a natural product by using real-life examples. **Same as** PMPG 516. May be repeated. **Prerequisite(s):** PMPG 515.

560
Organic Medicinal Chemistry I 3 hours.
 Organic reactions are discussed in terms of their mechanisms and utility in the field of medicinal chemistry, particularly in the synthesis of medicinal

agents. **Prerequisite(s):** One year of organic chemistry with laboratory.

561
Principles of Medicinal Chemistry 4 hours.
 Concerns basic chemical and physical principles necessary for an understanding of drug action. These principles are applied in the design and discovery of medicinal agents. **Prerequisite(s):** One year each of undergraduate organic chemistry and biochemistry. Requires concurrent registration in MDCH 592.

562
Spectroscopy in Medicinal Chemistry 3 hours.
 The fundamental principles used to determine structure and conformation in molecules, emphasizing spectroscopic methods useful in solving structural problems and in analyzing dynamic biological processes. **Prerequisite(s):** One year of physical chemistry or consent of the instructor.

564
Physical Medicinal Chemistry 3 hours.
 Focuses on kinetics and thermodynamics in biological systems. Applications to drug action will be emphasized. **Prerequisite(s):** One year of physical chemistry.

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. **Prerequisite(s):** MDCH 460 and MDCH 561.

572
Drug Design 2 hours.
 Quantitative structure-activity relationships, computer graphics, molecular modeling and simulation, and chemometrics as applied to drug design and discovery. **Prerequisite(s):** MDCH 561.

573
Principles of Stereochemistry 1 hour.
 Principles of molecular structure and stereochemistry for medicinal and natural products chemists focusing on stereochemical structures rather than synthesis. **Prerequisite(s):** Credit or concurrent registration in MDCH 560 and one year of organic chemistry with lab or consent of the instructor.

592
Research Techniques in Medicinal Chemistry 2 hours.
 Provides an initial biweekly informal seminar series with program faculty presenting a discussion of the ongoing research in her/his laboratory. May be repeated to a maximum of 6 hours. Lectures/discussions will be given for the first part of the semester and an intensive lab experience takes place for the remainder of the semester. To be taken fall and spring semesters of the first year of graduate study.

594
Special Topics in Medicinal Chemistry 2 TO 4 hours.
 An advanced course covering selected topics which may include new spectroscopic, theoretical, chemometric, and synthetic approaches to biomolecular structure and function. May be repeated to a maximum of 4 hours.
Prerequisite(s): MDCH 561 and MDCH 562 and one year of physical chemistry and one semester of biochemistry or consent of the instructor.

595
Seminar in Medicinal Chemistry 1 hour.
 Presentation on a current research topic. Satisfactory/Unsatisfactory grading only.

598
Master's Research in Medicinal Chemistry 0 TO 16 hours.
 Thesis research to fulfill master's degree requirements. Satisfactory/Unsatisfactory grading only.

599
Doctoral Research in Medicinal Chemistry 0 TO 16 hours.
 Research for doctoral students. Satisfactory/Unsatisfactory grading only.

Medicinal Chemistry and Pharmacognosy (PMMP)

412
Pharmaceutical Applications of Genomics and Bioinformatics 2 hours.
 Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. **Same as** MDCH 412. **Prerequisite(s):** PHAR 331 or consent of the instructor. For graduate students: one or two semesters of basic molecular biology and/or



biochemistry with a grade of B or better.

460 Organic Medicinal Chemistry I 3 hours.

Organic reactions in terms of their mechanisms and utility in the field of medicinal chemistry, particularly in the synthesis of medicinal agents. Upper-division elective taught simultaneously with MDCH 560, however, does not meet the prerequisite requirement of the medicinal chemistry graduate program. **Prerequisite(s):** One year of organic chemistry with laboratory

Microbiology and Immunology (MIM)

425 Fundamentals of Immunology and Microbiology 3 hours.

Mechanisms of host defense; antigens, immunoglobulins and their reactions; antibody synthesis, regulation and the cellular immune response; bacterial and viral structure and function; mechanisms of pathogenesis. **Prerequisite(s):** Consent of the instructor or registration in the College of Medicine.

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(s):** Consent of the instructor.

455 Microbiology Laboratory Rotation 3 hours.

Course in basic and applied methods essential for the study of nucleic acids, immunoglobulins, gene transfer, cell fusion, virological and immunological methods. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. Students may register in more than one section per term. **Prerequisite(s):** Graduate standing.

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. **Same as** BCMG 513 and PMPG 513. **Prerequisite(s):** GCLS 501 and one year of physical chemistry, or consent of the instructor.

551 Advanced Immunology 2 hours.

Concepts in immunochemistry, immunogenetics, molecular immunology, cellular immunology, and immunopathology at the intermediate level. **Prerequisite(s):** GCLS 501, GCLS 502, GCLS 503, and GCLS 510 or consent of the instructor.

553 Molecular Biology of Viruses 2 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(s): GCLS 501, GCLS 502, GCLS 503, and GCLS 511 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(s): BCHE 460.

560 Microbial Pathogenesis 2 hours.

Genetics, molecular biology, and physiology of pathogenic bacteria, and host-pathogen interactions.

Credit is not given for MIM 560 if the student has credit for MIM 552. **Prerequisite(s):** GCLS 501, GCLS 502, GCLS 503, and GCLS 511 or consent of the instructor.

585 Cell Biology 4 hours.

Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. **Same as** ANAT 585 and PHYB 585.

594 Special Topics in Microbiology, Immunology, and Virology 1 TO 2 hours.

Advanced topics are covered in depth. Topics vary yearly.

Prerequisite(s): BCHE 460 and MIM 451 and MIM 455 and MIM 552 and MIM 553 and consent of the instructor.

595 Seminar in Microbiology and Immunology 1 hour.

Topics of current research interest are presented by guest lecturers from outside institutions in areas of molecular biology, bacteriology, virology, and immunology. Satisfactory/Unsatisfactory grading only.

598 Research in Molecular Biology and Immunology 0 TO 16 hours.

MS thesis research on problems in microbiology, immunology, virology, and molecular biology. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Graduate standing in microbiology and immunology.

599 Research in Molecular Biology and Immunology 0 TO 16 hours.

PhD thesis research on problems in microbiology, immunology, virology, and molecular biology. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Graduate standing in microbiology and immunology.

Movement Sciences (MVSC)

400 Business Principles for the Fitness Professional 3 hours.

Provides a survey of basic requisite business principles and the application of these principles for students pursuing careers in corporate and community fitness. Previously listed as KINE 406. **Prerequisite(s):** MVSC 100; and junior standing or above.

403 Marketing and Facility Management in Exercise and Wellness 3 hours.

Introduction to management and marketing principles as they apply to promoting organizations. Theory and practice of managing exercise and wellness facilities. Previously listed as KINE 403. **Prerequisite(s):** Senior standing or above.

410 Human Aging and Physical Performance 3 hours.

Introduction to human aging focused on the impact of aging to physical structure and function. Investigate research-based evidence of the role of activity and exercise in altering physiology, life expectancy, disease, and disability prevention. Previously listed as KINE 404. **Prerequisite(s):** MVSC 252; and junior standing or above.

417 Aging and Physical Activity 3 hours.

Linking the effects of aging on motor performance to diagnostic procedures, prescriptive exercise, and instructional processes.

Previously listed as KINE 417. Extensive instrumentation experience. **Prerequisite(s):** MVSC 360 or the equivalent and junior standing or above; or consent of the instructor.

435 Psychology and Physical Activity 3 hours.

Analysis and application of psychological concepts related to process and outcomes of sport and exercise programs. Previously listed as KINE 412.

438 Exercise Adherence 3 hours.

Exercise behavior as it relates to habitual physical activity. Encompasses health outcomes, exercise adherence factors, intervention, strategies, and exercise settings. Previously listed as KINE 418.

441 Principles of Resistance Training 3 hours.

This course examines the physiological principles underlying resistance training and the development of safe and effective resistance training programs. **Prerequisite(s):** MVSC 352 and junior standing or above; or consent of the instructor.

442 Principles of ECG Interpretation 3 hours.

Introduction to the basic principles and interpretation of the electrocardiogram (ECG) as it relates to fitness programs involving the apparently healthy as well as cardiac rehabilitation patients. **Prerequisite(s):** Grade of C or better in MVSC 352; and junior standing or above; or consent of the instructor.

452 Advanced Exercise Physiology 3 hours.

In-depth study of the mechanisms that underly the acute and chronic responses to physical activity. Previously listed as KINE 421.

Prerequisite(s): MVSC 352; and junior standing or above and one college-level course in chemistry.

460 Neuromechanical Basis of Human Movement 3 hours.

Biomechanics of single and multi-joint systems, and its role in neural control of movement. Mechanisms of acute adaptations including warm-up, fatigue and potentiation, and chronic adaptations arising from reduced use or training. Previously listed as KINE 428.

Prerequisite(s): MVSC 160 and MVSC 252 and junior standing or above; or consent of the instructor.

463

Biomechanical Analysis of Sport Injuries 3 hours.
The biomechanical principles related to sport injuries. Previously listed as KINE 429. **Prerequisite(s):** MVSC 360.

472

Movement Neuroscience 3 hours.
Overview of the human nervous system. Emphasis is placed on the basic functional anatomical and physiological concepts relevant to the organization and execution of movement. Previously listed as KINE 472. **Prerequisite(s):** MVSC 251 and MVSC 252 and MVSC 352 and MVSC 372; and junior standing or above; or consent of the instructor.

481

Workshop in Movement Sciences 1 TO 3 hours.
Intensified study of selected activities, topics, processes, or areas in movement sciences. Topic will be announced. May be repeated if topics vary. Students may register in more than one section per term. Previously listed as KINE 481.

489

Seminars in Movement Sciences 1 TO 3 hours.
Weekly seminars devoted to research in movement sciences and related fields, followed by a one-hour discussion. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Junior standing or above.

490

Educational Practice with Seminar I 6 hours.
The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Previously listed as KINE 490. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

491

Educational Practice with Seminar II 6 hours.
The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Previously listed as KINE 491. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education pro-

gram, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in MVSC 490, and approval of the department.

496

Special Projects in Movement Sciences 1 TO 3 hours.
Independent research on special projects. Previously listed as KINE 494. **Prerequisite(s):** Approval by graduate faculty member and graduate director.

500

Research and Evidence-Based Practice in Movement Sciences 3 hours.
Training in the research approaches pertaining to specific areas of study in the movement sciences. Special emphasis is placed on accessing, evaluating, and applying findings in the primary literature as critical steps in evidence-based practice. Previously listed as KINE 590.

501

Current Research in Movement Sciences 1 hour.
In-depth analysis of current original research. May be repeated to a maximum of 10 hours with approval. Approval to repeat course granted by the department. Previously listed as KINE 521. **Prerequisite(s):** Consent of the instructor.

502

Movement Science 4 hours.
Synthesis of the body of knowledge in kinesiology using various diseases as a teaching model. Previously listed as KINE 522. **Prerequisite(s):** Consent of instructor.

520

Disability and Physical Activity 3 hours.
Examination of the foundations of physical activity for persons with disabilities. Emphasis on strategies for promoting physical activity among persons with disabilities in community settings. **Same as** DHD 520. Previously listed as KINE 540.

523

Exercise Biology in Health and Disease 3 hours.
Interrelationships between exercise and various pathological conditions. Current research focusing on molecular and cellular mechanisms in healthy and diseased states. **Same as** PHYB 523. Previously listed as KINE 523. **Prerequisite(s):** 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. Previously listed as KINE 527. **Prerequisite(s):** BIOS 524 and BIOS 525 and consent of instructor.

528

Cellular Response to Exercise 3 hours.
Examines cellular structure/function relationships important for acute and chronic adaptations to exercise. Emphasis on understanding cellular basis of physiological response to exercise. Previously listed as KINE 528. **Prerequisite(s):** BIOS 422 or consent of the instructor.

529

Exercise Genomics 3 hours.
Molecular mechanisms by which cells adapt to increases and decreases in physical activity. Emphasis on understanding genomic, transcriptional, translational and posttranslational sites of control. Previously listed as KINE 529. **Prerequisite(s):** BCH 460 or consent of the instructor.

535

Nutrition and Human Performance 2 hours.
Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. **Same as** HN 535. Previously listed as KINE 535. **Prerequisite(s):** HN 410; and PHYB 341 or MVSC 352; or consent of the instructor.

545

Advanced Exercise Programming and Assessment 3 hours.
Emphasis on current recommendations for exercise prescription and assessment methods for adult populations. Diagnostic and prescriptive procedures will be delineated. Previously listed as KINE 420. **Prerequisite(s):** MVSC 452 or consent of the instructor.

570

Neural Mechanisms Underlying Motor Control 4 hours.
Neurophysiological mechanisms that underlie the control and regulation of movement. Previously listed as KINE 570. **Prerequisite(s):** Consent of the instructor.

571

Biomechanics of Normal and Abnormal Movement 3 hours.
Principles of statics and dynamics exemplified by human movements.

Examination of muscle mechanics, joint forces, stability. Redundancy and intersegmental interactions in multijoint movements. **Same as** PT 571. **Prerequisite(s):** Consent of the instructor.

572

Psychology of Motor Control and Learning 3 hours.
Advanced principles of the control and acquisition of complex, voluntary skills. **Same as** PT 572. Previously listed as KINE 572. **Prerequisite(s):** MVSC 372; or consent of the instructor.

573

Advanced Topics in Motor Control and Learning 3 hours.
Contemporary theories and models in motor control and learning. Previously listed as KINE 573.

574

Instrumentation for Motor Control Research 3 hours.
Introduction to oscilloscopes, amplifiers, filters, and transducers. Origin and processing of electromyograms. Motion capture and processing techniques. **Same as** PT 574. **Prerequisite(s):** MVSC 571 or PT 571.

581

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. Previously listed as KINE 520. **Prerequisite(s):** MVSC 545.

590

Seminar in Movement Sciences 1 hour.
Final experience for 40-hour MS student. Student must demonstrate ability to synthesize material obtained in program and relate it to their area of concentration. Previously listed as KINE 589. **Prerequisite(s):** 32 semester hours of graduate credit and consent of major adviser.

592

Clinical Rotations in Exercise Physiology 1 TO 4 hours.
The clinical rotation serves as an avenue to introduce students to various experiences in clinical exercise physiology and as a precursor to a clinical internship. Fieldwork is required. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 4 hours. **Prerequisite(s):** Approval of the department.





593
Internship in Movement Sciences 1 TO 12 hours.
 Supervised internship in a laboratory or field setting. A written report is required. Normally open only to candidates in the Applied Exercise Physiology MS area of concentration. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. Credit is not given for MVSC 593 if the student has credit in MVSC 597 or MVSC 598. Fieldwork required. **Prerequisite(s):** Students must pass the comprehensive examination before placement at an internship site.

594
Selected Topics in Movement Sciences 1 TO 3 hours.
 Topic to be announced. Analysis of selected problems and concerns in specified concentrations. Topics vary from semester to semester, depending on the needs and interests of the graduate students. May be repeated if topics vary. Previously listed as KINE 594. **Prerequisite(s):** Consent of the instructor.

596
Independent Research in Movement Sciences 1 TO 4 hours.
 Topics vary. Students design, implement, and analyze a research problem in their individual area of concentration under the supervision of a faculty member. Previously listed as KINE 596. **Prerequisite(s):** MVSC 500.

597
Project in Movement Sciences 0 TO 8 hours.
 Supervised practicum in laboratory or field setting in which recent research findings are applied, tested, and evaluated. Satisfactory/Unsatisfactory grading only. May be repeated. Previously listed as KINE 597. **Prerequisite(s):** MVSC 500 and consent of the adviser and director of graduate studies.

598
Master's Thesis Research 0 TO 16 hours.
 Thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Previously listed as KINE 598. **Prerequisite(s):** MVSC 500 and consent of the adviser and director of graduate studies.

599
PhD Thesis Research 0 TO 16 hours.
 Independent research by the student under the supervision of the thesis adviser. Satisfactory/

Unsatisfactory grading only. May be repeated. Previously listed as KINE 599. **Prerequisite(s):** Students must have passed the preliminary exam.

Music (MUS)
490
Music Education: Special Topics 1 TO 4 hours.
 An investigation of various topics in music education pertinent to practicing music teachers. May be repeated. **Prerequisite(s):** Senior standing or above.

Native American Studies (NAST)
415
American Indian Ethnohistory 3 OR 4 hours.
 Introduction to ethnohistory, an interdisciplinary approach to researching, conceptualizing, and writing American Indian history. The course is organized topically and centers on classic and current monographs and articles. **Same as** HIST 415. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Junior standing or above and consent of the instructor. **Recommended background:** Courses in cultural anthropology, American Indian anthropology, American Indian literature.

471
Topics in Native American Literatures 3 OR 4 hours.
 The history and development of literature by and about American Indians. Content varies. **Same as** ENGL 471. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** Senior standing or above and 6 hours of English, African-American studies, or Latin American studies; or consent of the instructor.

Natural Sciences (NATS)
574
Advanced Study of Science Taught in Standards-Based Middle-Grade Science Curricula 3 hours.
 The advanced study of concepts underlying standards-based instruction in the natural sciences (chemistry, physics, earth science, and biology) in grades 5-8 is explored in a pedagogical context. **Prerequisite(s):** Consent of the instructor.

Neuroscience (NEUS)
403
Human Neuroanatomy 3 hours.
 Morphological organization of the nervous system. Functional correlations of neural structures. **Same as** ANAT 403. Meets eight weeks of the semester. **Prerequisite(s):** Graduate standing and consent of the instructor. Must be in a degree program.

501
Foundations of Neuroscience I 2 hours.
 Provide a core understanding of modern neuroscience and will be taught by faculty from multiple units. **Prerequisite(s):** Credit or concurrent registration in GCLS 503.

502
Foundations of Neuroscience II 2 hours.
 A core understanding of modern neuroscience. Will be taught by faculty from multiple units. Continuation of NEUS 501. **Prerequisite(s):** NEUS 501 and credit or concurrent registration in ANAT 403.

506
Research Rotations in Neuroscience 3 TO 6 hours.
 Research rotation course in which first-year students from the Neuroscience program will undertake research projects in laboratories affiliated with this program. May be repeated. Animals used in instruction. **Prerequisite(s):** Open only to PhD degree students.

511
Biomedical Neuroscience I: Molecular Biology of Synapses 2 hours.
 Molecular mechanisms of synaptic transmission. Information on the principal neurotransmitter systems, structure of ionotropic and metabotropic receptors and their signal transduction mechanisms. **Prerequisite(s):** NEUS 501.

512
Biomedical Neuroscience II: Aspects of Brain Function in Health and Disease 2 hours.
 An integrated view of brain function in health and disease; the anatomical and functional pathophysiological aspects underpinning major neurological and psychiatric disorders. **Prerequisite(s):** NEUS 501; or consent of the instructor.

591
Current Topics in Visual Neuroscience 2 hours.
 Discussion of current research and theoretical issues in visual neuroscience by staff, students, and guest

lecturers. May be repeated. **Prerequisite(s):** Consent of the instructor.
582
Methods in Modern Neuroscience 2 hours.
 Underlying principles and applications of techniques used to analyze nervous system organization and function. Behavioral, electrophysiological, anatomical, and biochemical approaches are considered. **Same as** BIOS 582. Animals used in instruction.

588
Human Neuroscience: Functional Magnetic Resonance Imaging 3 hours.
 Lectures and demonstrations present the principles of magnetic resonance imaging for understanding cognitive, sensory, and motor function of the human brain in health and disease. Extensive computer use required. Laboratory work required. **Prerequisite(s):** Consent of the instructor.

595
Seminar in Neuroscience 1 hour.
 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. Satisfactory/Unsatisfactory grading only. May be repeated.

596
Independent Study 1 TO 4 hours.
 Independent study under the direction of a faculty member. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

598
Master's Thesis Research in Neuroscience 0 TO 16 hours.
 Thesis research under the direction of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** NEUS 501 and NEUS 502 and NEUS 506; successful completion of first year core courses; and consent of the instructor. Open only to Master's degree students in Neuroscience.

599
Doctoral Research in Neuroscience 0 TO 16 hours.
 Independent research, directed by a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** NEUS 501 and NEUS 502 and NEUS 506; successful completion of first-year core courses; and consent of the instructor. Open only to PhD degree students in neuroscience.

Nursing Sciences (NUSC)

420

Pathophysiology and Pharmacotherapeutics I 3 hours.

First of two courses which provide an understanding of responses to disease and pharmacological treatments. Included are the therapeutic and toxic effects for major drug classes and basic microbiology principles. **Prerequisite(s):** MVSC 251 and MVSC 252 and graduate standing. Must enroll concurrently in NUSC 421.

421

Integrated Healthcare: Concepts and Skills 8 hours.

This course will provide the basis for understanding fundamental concepts to the practice of nursing across the life span. Theoretical concepts will be integrated with skills essential to practice.

Prerequisite(s): Graduate standing. Must enroll concurrently in NUSC 420.

422

Integrated Healthcare: Community 2 hours.

Theories of community assessment, disease prevention, and health behavior are applied to promotion of health for communities and vulnerable populations. Understanding of systems and collaboration with the interdisciplinary team are emphasized. **Prerequisite(s):** NUSC 420 and NUSC 421; and graduate standing.

423

Pathophysiology and Pharmacotherapeutics II 4 hours.

Second of two courses which provide an understanding of responses to disease and pharmacological treatments. Included are the therapeutic and toxic effects for major drug classes and basic microbiology principles. **Prerequisite(s):** Credit or concurrent registration in NUSC 420.

424

Integrated Healthcare: Adult/Older Adult 4 hours.

This course focuses on clinical evaluation/management of common/complex problems in adults and older adults. Emphasizes pathophysiology and management strategies in context of culture and ethnicity. **Prerequisite(s):** NUSC 420 and NUSC 421; and graduate standing.

425

Integrated Healthcare: Clinical Practice I 7 hours.

Provide students with experiences across all levels of prevention. Focus is on planning and implementing care for adults and older adults — individuals and populations. Students experience the systems of care from acute care to community. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): NUSC 420 and NUSC 421; and graduate standing. Must enroll concurrently in NUSC 422 and NUSC 424.

426

Cultural Fluency and Communication Skills 2 hours.

Course provides a foundation of communication skills, teaching and learning theory, and cultural competence for provision of nursing care.

Prerequisite(s): NUSC 420 and NUSC 421; and graduate standing.

427

Integrated Healthcare: Clinical Practice II 8 hours.

Provide students with experiences across all levels of prevention. Focus is on planning and implementing care for women, children, and the mentally ill in a variety of settings. Students experience the systems of care from acute care to community. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): NUSC 425 and graduate standing. Concurrent registration in NUSC 428 and NUSC 430.

428

Integrated Healthcare: Women, Children, and Family 4 hours.

Care for women throughout the life span, including pregnancy, birth, the postpartum and interconceptional periods, and throughout the aging process. **Prerequisite(s):** NUSC 420 and NUSC 421 and graduate standing.

429

Integrated Healthcare: Clinical Synthesis 7 hours.

Focus is on synthesis of nursing knowledge and skills and on implementation of leadership and management skills, including organizing care and delegation, in the provision of care. Clinical experiences occur in their area of concentration. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): NUSC 427 and graduate standing. Concurrent registration in NUSC 434.

430

Integrated Healthcare: Mental Health 2 hours.

Application and integration of biopsychosocial concepts and principles to the mental healthcare of individuals and groups across the continuum of care, including health promotion and illness prevention, maintenance, and rehabilitation.

Prerequisite(s): NUSC 420 and NUSC 421 and graduate standing.

432

Bioethics 2 hours.

Examine ethical decision-making models as applied to nursing. Use ethics committees, resolution of conflict around ethical dilemmas, impact of cultural/gender influences on ethical decision making and nursing's role as patient advocate.

Prerequisite(s): NUSC 420 and NUSC 421 and graduate standing.

434

Leadership in Professional Practice 3 hours.

Theories of leadership/management are analyzed in relationship to the new healthcare delivery system, nursing role, evidence-based practice, future trends, and the professional education continuum.

Prerequisite(s): NUSC 422 and NUSC 424 and NUSC 425 and NUSC 427 and NUSC 428 and NUSC 429 and graduate standing.

438

Infant Feeding: Historical, Societal, and Health Policy Issues 3 hours.

Examines infant feeding practices from historical, contemporary societal, and political dimensions. The importance of infant feeding in developing countries as well as legislation regarding infant feeding are also examined. **Prerequisite(s):** Consent of the instructor.

440

Wholistic Health: Use of Self 2 hours.

Comprehensive mind, body, and spiritual healthcare. Spiritual assessment of self, individuals, and families. Self as a therapeutic agent/health provider for wholistic healthcare. **Prerequisite(s):** Graduate standing; or senior standing and consent of the instructor.

441

Wholistic Health: Community Focus 2 hours.

Community and congregational assessment. Health beliefs and practices of faith communities and their impact on healthcare services, communities, and systems to foster planned change. **Prerequisite(s):** Graduate standing; or senior standing and consent of the instructor.

450

Women and Mental Health Nursing 3 hours.

Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. **Same as GWS 450 and NUWH 450.**

Prerequisite(s): 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 or GWS 315.

455

Women's Health: A Primary Healthcare Approach 3 hours.

Health promotion and disease prevention in women's health. Includes community experience with community women. Primary healthcare approaches examined. **Same as CHSC 456 and NUWH 455.**

Prerequisite(s): Consent of the instructor.

460

Individualized Internship 1 TO 5 hours.

Intensive internship experience will consist of a practicum that will develop skills, competencies, and knowledge in a focused healthcare delivery setting. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

494

Special Topics 1 TO 3 hours.

Discusses selected topics of current interest. Offered according to sufficient student demand and instructor availability. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

499

Urbana Nursing Registration 0 TO 16 hours.

Special course created to accommodate College of Nursing students in Urbana. Represents UIUC registration for undergraduate and graduate nursing students. Satisfactory/Unsatisfactory grading only. No graduation credit.

500

Introduction to the Clinical Nurse Specialist Role 1 hour.

Models and role competencies of the clinical nurse specialist. **Prerequisite(s):** NUSC 527.

505

Philosophy of Science for Health Research 3 hours.

Traces the development of scientific reasoning and explanation from Aristotle to the present, focusing on



the nature of knowledge and role of truth for health research.

Prerequisite(s): Graduate-level research course or consent of the instructor.

506

Theory and Theory Development for Nursing Research 3 hours.

Methods of theory development and critical analysis of selected biological, behavioral, health service, and grand nursing theories which form the basis of nursing science are examined. **Prerequisite(s):** NU SC 505.

511

Advanced Research Design 4 hours.

In-depth analysis of research design, including such areas as design appropriateness and validity, sampling, research ethics, and interpretation. Application of the content to nursing and related fields.

Prerequisite(s): Credit or concurrent registration in NU SC 505; and graduate-level statistics or consent of the instructor.

515

Measurement in Health Research 4 hours.

Qualitative and quantitative measurement theories; assessment of reliability, validity, and data quality. Critical analysis of measurement issues across the continuum of measures in health research.

Prerequisite(s): Credit or concurrent registration in NU SC 506 and NU SC 511 or consent of the instructor and credit or concurrent registration in the second course in graduate-level statistics series.

517

Advanced Research Practicum 1 TO 4 hours.

An intensive guided research practicum in design, data collection, psychometric analysis, or specific analytic technique relevant to the student's research specialization. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. Must be repeated for a minimum of 3 hours of credit.

Prerequisite(s): NU SC 515 and two advanced statistics courses.

520

Dying, Loss, and Grief 3 hours.

Analysis of social, cultural, and psychological aspects of human grief, loss/death within families and professional caregivers surrounding palliative and end-of-life care.

522

Palliative Management of Pain and Common Symptoms 3 hours.

Evidence-base of biobehavioral strategies for palliative management of pain and common symptoms in life-limiting and chronic illness across the lifespan.

524

Sociocultural and Ethical Issues in Palliative Care 3 hours.

Using an ethics theoretical framework, this course explores social, cultural, and political factors that influence palliative care for clients and families across the life span.

525

Intermediate Statistics 3 hours.

Application and interpretation of statistical techniques appropriate for health sciences. Prepares students to think quantitatively, use computer to perform statistical analysis, and assess data critically.

Prerequisite(s): 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(s): Credit or concurrent registration in NU SC 525 or the equivalent.

527

Nursing Inquiry II 2 hours.

Continuation of NU SC 526, emphasizing the methods of theory development and theory testing in selected areas of nursing sciences. Ethical issues in research.

Prerequisite(s): NU SC 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.

Examines advanced practice in nursing from historical, contemporary, and future dimensions. May be repeated. Students may register in more than one section per term. Only students enrolled in specific nursing concentrations are allowed to repeat course. **Prerequisite(s):** NU SC 528.

530

Physiologic Basis of Nursing Practice Across the Life Span 4 hours.

Advanced contemporary physiologic principles and their relevance to clinical practice. Content topics will include developmental (life span) physiologic changes.

Prerequisite(s): An undergraduate physiology course or consent of the instructor.

531

Pharmacotherapeutics in Advanced Practice in Nursing 3 hours.

Advanced principles of pharmacotherapeutics. Includes legal issues, client adherence, and medication selection factors.

Prerequisite(s): Credit or concurrent registration in NU SC 530 or credit or concurrent registration in NU SC 535 or the equivalent or consent of the instructor.

532

Comprehensive Health Assessment for Advanced Practice 0 TO 3 hours.

Includes physical, psychosocial, developmental, occupational, sexual, cultural assessments across the life spans, emphasizing differences between normal and abnormal.

Students synthesize results in client's health status. Students register for either 2 or 3 credit hours. Students registering for three credit hours must register for two additional laboratory-discussion hours per week. **Prerequisite(s):** NU SC 210 or the equivalent or consent of the instructor.

533

Applied Pharmacotherapeutics in Advanced Practice in Nursing 1 hour.

Application of pharmacology principles to subspecialty populations. May be repeated to a maximum of 2 hours. **Prerequisite(s):** Credit or concurrent registration in NU SC 531.

535

Biological Basis of Disease 4 hours.

Provides a foundation for clinical therapeutics through an understanding of biophysical mechanisms of disease. Basic concepts of pathological processes are examined with application to organ systems and across the lifespan.

Prerequisite(s): Undergraduate physiology and pathophysiology courses.

540

Instructional Strategies for the Nurse Educator 3 hours.

Introduction to educational theory, methods, and strategies for nursing instruction and evaluation in classroom, clinical, and online teaching.

Prerequisite(s): Consent of the instructor.

541

Teaching Practicum for the Nurse Educator 3 hours.

Application of educational theory, methods, and strategies for nursing education, curriculum development, program evaluation, or education administration in classroom, school, clinical or other selected settings.

Prerequisite(s): Credit or concurrent registration in NU SC 540 or credit or concurrent registration in NU SC 542; and consent of the instructor.

542

Curriculum Processes in Nursing Education 3 hours.

Builds on basic instructional strategies to prepare the nurse educator for faculty role in various levels of programs, including curriculum design and evaluation.

Prerequisite(s): Consent of the instructor.

543

Issues for Nurse Educators and Administrators 3 hours.

Focuses on issues in nursing education administration in the context of society, healthcare, and nursing, especially strategic planning, resources, political influences, conflict, change and leadership.

Prerequisite(s): 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(s): Consent of the instructor.

548

Methodological Issues for Cross-Cultural Research 3 hours.

Conceptual, methodological, and ethical issues for research with varied racial/ethnic backgrounds. Applies acculturation, translation, immigration, and health behavior issues to clinical, community, and international settings.

Prerequisite(s): NU SC 511; and consent of the instructor.





550
Issues for Research and Practice in Women's Health 3 hours.

Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women's healthcare practice are developed as a basis for research. **Same as** NUWH 550.

Prerequisite(s): Consent of the instructor.

552
Responsible Conduct of Research 1 hour.

Overview of the major ethical issues in the conduct of research with human or animal subjects with strategies for resolving these issues. Course is required by National Institutes of Health for all students supported by a National Research Service Award. **Prerequisite(s):** Open only to PhD degree students or consent of the instructor.

555
Theories and Methods in Women's Health Nursing Research 3 hours.

Critical analysis of theoretical and methodological approaches in women's health nursing research. Emphasis on evaluation schema useful to researchers. **Same as** NUWH 555. **Prerequisite(s):** NUSC 550 or NUWH 550, and consent of the instructor.

560
Theoretical Basis for Primary Healthcare 3 hours.

Students analyze the conceptual basis of primary healthcare applicable to diverse communities and develop a primary healthcare model specific to a community of interest.

561
Ethical Issues in Primary Healthcare 3 hours.

Examination of the ethical components of primary healthcare as a philosophy, strategy and level of care; and explication of personal framework for analysis of a specific health issue. **Prerequisite(s):** NUSC 560 or consent of the instructor.

562
Primary Healthcare Research Methods 3 hours.

Conceptual issues, advanced methodologies, and dissemination strategies for scientifically sound and policy relevant global primary healthcare research. Building community relationships for primary healthcare research.

Prerequisite(s): NUSC 511 and NUSC 560 or the equivalent or consent of the instructor.

565
Advanced Research in Women's Health 1 TO 2 hours.

Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique ongoing and developing research. **Same as** NUWH 565.

Prerequisite(s): Consent of the instructor.

570
International Dimensions in Women's Health 3 hours.

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. **Same as** NUWH 570. **Prerequisite(s):** Consent of the instructor.

575
Minority Women's Health Nursing 3 hours.

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. **Same as** NUWH 575. **Prerequisite(s):** Consent of the instructor.

580
Health Services and Health Behavior Research: Models and Frameworks 3 hours.

Examines and critiques individual, systems, and community-level models and frameworks which guide health services delivery and health promotion behavior research.

Prerequisite(s): NUSC 505 and NUSC 506; or consent of the instructor.

581
Health Services and Health Behavior Research: Methods and Measurement 3 hours.

Critically analyzes methodological and measurement issues which are important to advanced research in health services delivery and health promotion behavior.

Prerequisite(s): NUSC 511 and NUSC 515 and NUSC 580; or consent of the instructor.

585
Advanced Research Seminar 1 TO 2 hours.

Integrates theory and methods for health research. Topics vary according to student interests and instructor availability. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. A

minimum of 2 hours of credit is required; a maximum of 4 hours of credit may be applied toward the PhD. **Prerequisite(s):** Consent of the instructor. Open only to PhD degree students.

590
Leadership in Scientific Careers 1 hour.

Analyzes components of leadership in science at the national and global levels. Analyzes factors and issues of the discipline affecting a research career. Analyzes the interdependency of the science to policy cycles of influence.

Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** NUSC 517. Open only to PhD degree students.

592
Preliminary Exam Preparation 1 TO 12 hours.

Literature review, reading, and writing in preparation for the preliminary examination supervised by faculty research adviser. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 24 hours. **Prerequisite(s):** Completion of core courses and consent of the instructor.

594
Special Topics: Advanced 1 TO 3 hours.

Discusses selected topics of current interest. Offered according to sufficient student demand and instructor availability. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

595
Seminar in Nursing 1 TO 3 hours.

Identifies and analyzes a broad range of issues related to modern nursing and nursing research. Topics vary according to student interests and instructor availability.

Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596
Independent Study: Graduate 1 TO 4 hours.

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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

597
Master's Project 0 TO 16 hours.

Master's student project research. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

598
Master's Thesis Research 0 TO 16 hours.

Master's student thesis research. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

599
PhD Thesis Research 0 TO 16 hours.

Doctoral student thesis research. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

Occupational Therapy (OT)

401
Occupational Performance in Adults and Adolescents 4 hours.

Reviews the primary developmental aspects and roles of adolescence and adulthood. Personal and environmental factors that influence occupational performance and prevention and wellness models to facilitate occupational functioning. **Prerequisite(s):** Admission to the Master of Science in Occupational Therapy program.

406
Development of a Therapeutic Self 3 hours.

Emphasizes understanding and developing foundational skills in therapeutic use of self and forms of therapeutic reasoning. Group theory and process is introduced and group leadership skills developed.

Prerequisite(s): Admission to the Master of Science in Occupational Therapy program.

407
Introduction to Occupational Therapy Practice 2 hours.

Overview of the role of the therapist and aspects of occupational therapy practice in multiple settings. The basics of assessment, treatment planning, intervention, and documentation as well as service delivery systems and current issues.

Prerequisite(s): Admission to the Master of Science in Occupational Therapy program.

411
Occupational Performance in Children 4 hours.

Developmental theories concerning factors influencing the development of occupational performance in

infancy, childhood, and early adolescence. Developmental assessment methods and tools.

Prerequisite(s): Grade of C or better in OT 401 and grade of C or better in OT 407; and graduate standing; and consent of the instructor.

412

Human Structure and Function 5 hours.

Anatomical and physiological basis for occupational performance. Features structure and function of musculoskeletal, cardiovascular, and nervous systems and application of biomechanical principles.

Prerequisite(s): Admission to the Master of Science in Occupational Therapy program.

416

Occupational Therapy Practice: Psychosocial Aspects of Occupational Performance 3 hours.

Occupational therapy practices relevant to psychosocial intervention, related bodies of knowledge influencing practice, psychological process affecting occupational functioning, and assessment and treatment related to psychosocial problems. **Prerequisite(s):** Grade of C or better in OT 401 and grade of C or better in OT 407; and graduate standing; and consent of the instructor.

420

Community Practicum 1 hour.

Field experience in a community agency serving an urban population. Emphasis is on service learning in context and the development of professional behaviors.

Satisfactory/Unsatisfactory grading only. May be repeated. Fieldwork required. **Prerequisite(s):** Admission to the Master of Science in Occupational Therapy program.

422

Medical Conditions 1 hour.

This self-paced course reviews etiology, clinical manifestation, clinical course, and general medical and rehabilitative management of common medical conditions; emphasis on musculoskeletal, neurologic, cardiopulmonary and psychiatric disorders. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Admission to the Master of Science in Occupational Therapy program.

424

Contexts of Occupational Therapy Practice 2 hours.

Trends in healthcare, reimbursement, legislation, and disability policy

and how they affect occupational therapy. The policy process and development of an advocacy role.

Exposure to community-based practice and consultation roles.

Prerequisite(s): Grade of C or better in OT 407; and graduate standing.

428

Fieldwork Level I 3 hours.

Application of occupational therapy theory and therapeutic reasoning in a forty-hour/week fieldwork experience with the opportunity to develop beginning therapeutic skills and professional behavior. Fieldwork required.

Prerequisite(s): Grade of C or better in OT 411 and grade of C or better in OT 412 and grade of C or better in OT 416; and satisfactory completion of OT 422 and graduate standing; and consent of the instructor.

436

Occupational Therapy Practice: Functional Movement and Mobility 5 hours.

Application of occupational therapy evaluation and intervention skills to children and adults with occupational performance deficits resulting from mobility and movement dysfunction. **Prerequisite(s):** Grade of C or better in OT 411 and grade of C or better in OT 412 and grade of C or better in OT 416; and satisfactory completion of OT 422 and graduate standing.

437

Occupational Therapy Practice: Cognition and Perception in Action 4 hours.

The impact of impaired cognitive and perceptual processes on occupational performance of children and adults with neurological conditions, cognitive and intellectual disabilities, and psychiatric disabilities.

Prerequisite(s): Grade of C or better in OT 411 and grade of C or better in OT 412 and grade of C or better in OT 416; and satisfactory completion of OT 422 and graduate standing.

448

Fieldwork Level IIA 8 hours.

First of two supervised full-time twelve-week practica with emphasis on application of OT theory, development of psychomotor skills, reasoning client-related problems, and professional socialization as an entry-level occupational therapist. Satisfactory/Unsatisfactory grading only. Fieldwork required.

Prerequisite(s): Grade of C or better in OT 428 and grade of C or better in OT 436 and grade of C or better in OT 437; and

graduate standing; and consent of the instructor.

449

Fieldwork Level IIB 4 hours.

Second of two supervised full-time practica with emphasis on application of OT theory, development of psychomotor skills, reasoning client-related problems, and professional socialization as an entry-level occupational therapist.

Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. Fieldwork required. Scheduled full time for a 6 week period. **Prerequisite(s):** Grade of C or better in OT 428 and grade of C or better in OT 436 and grade of C or better in OT 437; and graduate standing; and 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(s): Consent of instructor.

510

Research in Occupational Therapy 3 hours.

Introduction to basic elements of research design relevant to occupational therapy practice. Prepares student to become critical consumer of research in occupational therapy and related fields. Quantitative and qualitative approaches to research.

Prerequisite(s): Admission to the Master of Science in Occupational Therapy program, or consent of the instructor. **Recommended background:** Statistics and research methods background.

515

Synthesis I 1 hour.

Integrating theory, practice, and research knowledge and skills across courses using case studies and small group learning activities. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Grade of C or better in OT 401 and grade of C or better in OT 406 and grade of C or better in OT 407 and grade of C or better in OT 500 and grade of C or better in AHS 510.

526

Assistive Technology and the Environment 3 hours.

Assessing the need for, delivering, and evaluating the outcomes of

occupationally-based technology and environmental interventions with people with disabilities within the home, school, workplace, and community. **Prerequisite(s):** Grade of C or better in OT 411 and grade of C or better in OT 412 and grade of C or better in OT 416 and grade of C or better in AHS 510.

530

Advanced Field Experience: Clinical Specialization in Occupational Therapy 1 TO 4 hours.

Provides opportunity for the student interested in advanced occupational therapy practice to observe a master clinician and participate in treatment and/or clinical research.

Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

531

Advanced Field Experience in Occupational Therapy Management 1 TO 4 hours.

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.

Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

532

Advanced Field Experience: Occupational Therapy Education 1 TO 4 hours.

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. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

534

Sociocultural Aspects of Occupational Therapy 3 hours.

Addresses social and cultural contexts in which chronic illness and disability are experienced; contexts which impact that experience, and broad contexts in which recovery/accommodation and occupational therapy treatment occur.

Prerequisite(s): Grade of C or better in OT 424 and grade of C or better in OT 428 and grade of C or better in OT 526.

535

Synthesis II 2 hours.

Integrating advanced theory, practice, and research knowledge and skills across courses using complex



individual and programmatic case studies and small and large group intervention planning activities. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Grade of C or better in OT 424 and grade of C or better in OT 428 and grade of C or better in OT 526 and satisfactory completion of OT 422.

536 Fatiguing Conditions and Disability 3 hours.

Empirically supported concepts related to assessment and management of fatiguing conditions. Course also explores the relationship between fatigue and disability from social, psychological, and community-based perspectives.

Same as DIS 536.

Recommended background: Health or behavioral sciences.

540 Advanced Topics in Occupational Therapy Research and Evaluation 4 hours.

In-depth presentation of selected research/measurement strategies. Specific topics vary and include single system design, survey research, ethnography, evaluation of clinical effectiveness. May be repeated. Students may register in more than one section per term.

Prerequisite(s): 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(s): OT 400 or consent of the instructor.

542 Advanced Clinical Reasoning and Therapeutic Use of Self in Occupational Therapy 2 hours.

Teaches occupational therapy students advanced skills in forming and maintaining ethical, empathic, and successful treatment relationships with their clients.

544 Cognitive Behavioral Therapy for Persons with Chronic Illness and Disability 4 hours.

Core concepts of cognitive behavioral therapy for individuals with chronic illnesses and disabilities from practice and theoretical perspectives. **Recommended background:** Exposure to course work

in therapeutic use of self, psychopathology, or in psychosocial aspects of occupational therapy.

550 Disability in the Urban Environment 4 hours.

Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities. **Same as** DIS 550.

551 Computers, Communication, and Controls in Rehabilitation Technology 3 hours.

Provides information on operation and use of alternative controls for computers, augmentative communication devices, and powered mobility. Emphasis on matching consumer's need and assistive technology. **Same as** DHD 551.

Recommended background: Speech-Language Pathology, Occupational Therapy, Special Education.

552 Community-Based Interventions with Underserved Populations 4 hours.

Addresses theories, ethics, and strategies of developing and providing outcomes-based clinical interventions in underserved communities. Students collaborate with a community population to implement course concepts.

Prerequisite(s): Level II fieldwork or prior work experience or consent of the instructor. **Recommended background:** OT 550.

553 Program Evaluation: Documenting the Impact of Human Services 3 hours.

Examines methods in program evaluation with emphasis on empowerment and participatory evaluation. Students will study quantitative and qualitative strategies, how to communicate information to stakeholders, and how to design evaluations. **Same as** DHD 553. **Recommended background:** Interest in research, health or behavioral sciences, and implementation and evaluation of community initiatives and community-based organizations.

554 Applied Professional Ethics in Occupational Therapy 2 hours.

Integrates advanced theory, practice, and research knowledge and skills from fieldwork and course work to identify and mitigate ethical dilem-

as, legal concerns, and/or complex intervention problems encountered in occupational therapy practice.

Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Grade of C or better in OT 500 and grade of C or better in OT 510.

555 Synthesis III 2 hours.

Integrating advanced theory, practice, and research knowledge and skills from advanced fieldwork and course work using complex case studies and small group assessment and intervention planning activities from students' fieldwork experiences.

Satisfactory/Unsatisfactory grading only. Fieldwork required.

Prerequisite(s): OT 448.

556 Theory and Methods of Needs Assessment in Aging and Disability 4 hours.

Introduces theories of need, models of the needs assessment process, and reviews research methods typically used in conducting needs assessments. Emphasis will be on needs assessments in health-related community agencies. **Same as** CHSC 556 and DIS 556.

Prerequisite(s): A 400 or 500-level research course such as OT 510, DHD 415, CHSC 446, or SOC 500. The prerequisite research course needs to provide students with an understanding of basic research design, sampling strategies, and an introduction to methods such as surveys and focus groups.

Recommended background: Health or behavioral sciences, research methods.

557 Acting on Needs Assessment Findings 3 hours.

Follows OT 556, focusing on the translation of needs assessment findings into solution strategies.

Addresses setting needs-based priorities, developing solutions, setting action plans, and working with communities to enact those plans.

Prerequisite(s): Grade of C or better in OT 500 and grade of C or better in OT 510 and grade of C or better in 556; or consent of the instructor.

558 Writing for Professional Publications in Occupational Therapy 3 hours.

Addresses processes and issues related to writing for publication in occupational therapy and related journals and magazines, including preparation and submission processes, IRB, receiving critiques,

and communicating with reviewers and editors. **Prerequisite(s):** Grade of C or better in OT 500 and grade of C or better in OT 510.

564 Administration and Management in Occupational Therapy 3 hours.

Overview of issues related to administration and management in varied settings in which occupational therapists practice. Topics include management functions, service planning, quality improvement, financial management, and accreditation.

Prerequisite(s): OT 428 or approval of the department.

565 Research Methodology and Outcomes Measures in Rehabilitation Technology 3 hours.

Analyzes the research process in rehabilitation technology and assistive technology and how such analysis leads to the development of a research proposal. Outcome measures related to assistive technology will be evaluated for their applicability. **Same as** DHD 565.

Recommended background: Engineering, occupational therapy, physical therapy, special education, and speech and language pathology.

567 Professional Leadership in Occupational Therapy 3 hours.

Focuses on application of theory and evidence in administrative, managerial, and educational leadership. Examines roles and functions of leaders and application of problem solving, change management, and quality improvement in a variety of settings. **Prerequisite(s):** Grade of C or better in OT 564; or consent of the instructor.

568 Occupational Therapy Professional Curriculum Design, Implementation, and Evaluation 3 hours.

Didactic material and experiential learning as students explore design and implementation of a professional curriculum. Students will be exposed to student admissions, advising, student life, and accreditation. **Prerequisite(s):** Consent of the instructor.

590 Proseminar in Occupational Therapy 2 hours.

Topics related to leadership/management, education, and advanced practice in occupational therapy. Satisfactory/Unsatisfactory grading





only. May be repeated. Open only to OTD students, or consent of the instructor.

592
Project Research 0 TO 16 hours.

Applied scholarship involving planning and implementation of one or more action projects based on theory and evidence, evaluation, writing a comprehensive report, dissemination, and oral presentation. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

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(s): Consent of the instructor.

595
Seminar in Occupational Therapy 1 hour.

Prethesis seminar. Students participate in faculty-student discussion and activities related to individual areas of research/thesis. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** 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(s):** Consent of the instructor.

597
Project Research 0 TO 8 hours.

Independent scholarship focusing on problems of application in field. Students undertake an action project, create a method for dissemination, and orally present the project. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 8 hours.

Prerequisite(s): Graduate standing in the Master of Science in Occupational Therapy program and consent of the instructor.

598
Research in Occupational Therapy 0 TO 16 hours.

Independent research in occupational therapy, directed by a faculty member. MS students are required to take a minimum of 7 credit hours. Satisfactory/Unsatisfactory grading only. May be repeated.

Students may register in more than one section per term.

Prerequisite(s): Foundation

courses in research methods, such as OT 510, and statistics, or consent of the instructor.

Oral and Maxillofacial Surgery (OSUR)

510
Conscious Sedation and General Anesthesia 3 hours.

Didactic lectures in all phases of pain and anxiety control, supplemented with clinical experience in administration of general anesthetic and inhalation and intravenous sedatives. Satisfactory/Unsatisfactory grading only. May be repeated.

511
Oral Surgery Seminar 2 hours.

Lecture, seminars, conferences, and journal clubs dealing with current topics of clinical and research interest. Satisfactory/Unsatisfactory grading only.

513
Craniofacial Deformity Seminar 1 hour.

Discusses the investigation, evaluation, treatment planning, and follow-up monitoring of patients with dentofacial deformities. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Admission to oral and maxillofacial surgery residency or orthodontics graduate program.

530
Oral and Maxillofacial Surgery Diagnostic Seminar 2 hours.

A series of seminars dealing with differential diagnosis and treatment of oral lesions. Satisfactory/Unsatisfactory grading only.

532
Diagnosis and Treatment Planning in Orthognathic Surgery 2 hours.

Nonorthognathic 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.

The methodology for critical review of medical literature and discussion of key articles appearing in appropriate medical journals. Satisfactory/Unsatisfactory grading only.

561
Physical Diagnosis 4 hours.

In-depth methods of obtaining a history and performing physical

diagnosis of the entire body through theoretical and practical lessons.

Oral Medicine and Diagnostic Sciences (OMDS)

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. **Prerequisite(s):** ANAT 312 and BCHE 411 and HSTL 451 and 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(s): 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(s): 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(s): Consent of the instructor.

527
Oral Biology Seminar 1 hour.

Invited speakers present the progress of current research work in their field of interest related to oral tissues. **Same as** HSTL 514. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

529
Electron Microscopy in Dentistry 1 hour.

Principles, theory and practice of transmission and scanning electron microscopy, and energy dispersive X-ray microanalysis. Processing, sectioning, staining, and examination of tissues. **Same as** HSTL 515.

Prerequisite(s): Consent of the instructor.

595
Seminar in Oral Pathology 2 hours.

Reviews, reports, and discussion topics are drawn from the literature and material of surgical oral pathology. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

598
Research in Oral Pathology 0 TO 16 hours.

Independent thesis research on basic biomedical phenomena or specific oral disease(s). Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the adviser.

Oral Sciences (OSCI)

451
Research Methodology 1 hour.

Designed to help the student understand, utilize, and appreciate the process of scientific inquiry. Primarily intended for students enrolled in the Master of Science in Oral Sciences degree program. **Prerequisite(s):** 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. **Prerequisite(s):** BCMG 411 and HSTL 451 or the equivalent courses, or consent of the instructor.

534
Dental and Medical Anthropology within Human Evolution 1 TO 3 hours.

Studies the biological and physical anthropology of hominid teeth and the craniofacial complex with relevant medical anthropology, ethno-pharmacology, forensic sciences, and paleopathology topics. **Same as** ANTH 534 and PMPG 534. Fieldwork required. A lab experience, independent study, and a research paper are required for 3 hours of credit.

Prerequisite(s): Graduate standing and consent of the instructor.

580
Advanced Oral Sciences I 2 hours.

Discussion follows presentation of faculty research. Topics include developmental and molecular biology, tissue engineering, genetics, and structural biology in tandem with cutting-edge dental technology.

581
Advanced Oral Sciences II 2 hours.
Continuation of OSCI 580.
Prerequisite(s): OSCI 580.

583
Research Laboratory Rotation 1 TO 4 hours.
Students participate directly in laboratory research, learn to approach a scientific problem, and perform various experimental techniques to investigate the problem. May be repeated to a maximum of 6 hours.

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(s): Consent of the instructor.

593
Independent Research in Oral Sciences 1 TO 8 hours.
Faculty supervised research projects. Research may not duplicate that being done in OSCI 598. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.

594
Special Topics in Oral Sciences 1 TO 4 hours.
Content varies. Selected topics of current interest in oral sciences. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Graduate or postgraduate standing and consent of the instructor.

596
Independent Study 1 TO 4 hours.
Faculty-supervised independent study not included in regular course offerings. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Consent of the instructor.

598
Master's Thesis Research 0 TO 16 hours.
Thesis research to fulfill master's degree requirements. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Matriculation into the Master of Science in Oral Sciences program and consent of the director of graduate studies.

599
Doctoral Thesis Research 0 TO 16 hours.
Independent investigation carried out by PhD candidates under supervision of the student's Advisory Committee. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): Satisfactory completion of Candidacy Examination.

Orthodontics (ORTD)

513
Craniofacial Growth and Development 4 hours.
Physiology of the stomatognathic system, behavioral development, implications of craniofacial growth and development, reactions of periodontal tissues to applied force and prevalence; causes of malocclusion. **Prerequisite(s):** Matriculation into the Certificate Program in Orthodontics or MS in Oral Sciences program.

521
Methodologies in Craniofacial Research 1 hour.
Demonstration and discussion of the techniques and methods employed in the study of the structure, growth, and function of the craniofacial region.

524
Craniofacial Anomalies I 2 hours.
Introduction to a variety of orofacial clefts, etiology, clinical presentation, growth and development, and habilitation via an interdisciplinary team approach. Longitudinal analysis of cases with cleft lip and palate.

525
Craniofacial Anomalies II 1 hour.
Introduction to treatment aspects of patients with orofacial clefts and to a variety of craniofacial anomalies, their etiology, clinical presentation, growth and development, and habilitation through a team approach. Clinical rotations through the Center for Craniofacial Anomalies. **Prerequisite(s):** ORTD 524.

537
Biostatistics Applied to Craniofacial Research 2 hours.
Multivariate statistical techniques applied to craniofacial growth research. **Prerequisite(s):** ORTD 523 and a basic univariate statistics course.

595
Seminar in Orthodontics 1 TO 2 hours.
Presentations by selected guest lecturers on research or clinical material relating to matters of interest to the Department of Orthodontics. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 13 hours. **Prerequisite(s):** Enrollment in the Orthodontics postgraduate or Oral Sciences graduate program.

Pathology (PATH)

421
General Pathology—Dental 3 hours.
Basic principles of pathological processes. **Prerequisite(s):** ANAT 440 and PATH 407 and PHYB 401; or consent of instructor.

422
Systemic Pathology—Dentistry 3 hours.
Disease process affecting specific organs. **Prerequisite(s):** 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. **Prerequisite(s):** ANAT 425 or ANAT 440 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(s):** 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 clinicopathological correlation. **Prerequisite(s):** PATH 425 and consent of the instructor.

501
Experimental Pathology 3 hours.
Survey of experimental pathology: general principles and techniques. **Prerequisite(s):** PATH 425 and PATH 426 or the equivalent or consent of the instructor.

503
Molecular Pathology 2 hours.
Molecular pathology principles and techniques; application to unfold

molecular basis of disease. Molecular diagnostic testing to determine disease by examining RNA, DNA, or protein.
Prerequisite(s): PATH 501.

506
Medical Immunology and Flow Cytometry 2 hours.
This flow cytometry workshop has been designed to fill the needs of graduate students in the understanding of the basic principles of the flow cytometry. Extensive computer use required. **Prerequisite(s):** Graduate or professional standing and consent of the instructor.

507
Physiological Basis of Pathology 2 hours.
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." **Same as** HSTL 507. **Prerequisite(s):** HSTL 452; or PATH 421 and PATH 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. **Prerequisite(s):** PATH 425 and PATH 426.

509
Clinical Pathophysiology II 3 hours.
Continuation of PATH 508. Pathophysiologic disease processes in the following systems: gastrointestinal, hepatobiliary nervous, female and male genitourinary, skin, musculoskeletal, and endocrine. **Prerequisite(s):** PATH 508.

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(s):** BCHE 460 or the equivalent.

527
Clinical Laboratory Method Evaluation 3 hours.
Development and comparison of clinical laboratory methods; also, statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. **Same as** MLS 527. **Prerequisite(s):** Consent of the instructor.





530
Medical Bacteriology 3 hours.
Principles, theory, and practice of diagnostic bacteriology and infectious diseases. **Prerequisite(s):** 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(s):** MIM 452 or consent of the instructor.

595
Pathology Seminar and Journal Club 2 hours.
Weekly seminar and journal club covering selected fields of interest and research in pathology. Satisfactory/Unsatisfactory grading only.

598
Master's Thesis Research 0 TO 16 hours.
Research in experimental pathology towards MS degree. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

599
PhD Thesis Research 0 TO 16 hours.
Research in experimental pathology towards a PhD degree. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Pediatric Dentistry (PEDD)

410
Principles and Methods in Dental Research I 2 hours.
Introduces students to several of the more commonly used statistical procedures for testing hypotheses; provides students with a beginner's set of tools for using statistics. **Prerequisite(s):** Enrollment in postgraduate 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(s):** 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(s):** PEDD 501.

595
Pediatric Dentistry Seminar 2 hours.
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. Satisfactory/Unsatisfactory grading only.

Pharmacognosy (PMPG)

480
Biological Evaluation of Natural Products 3 hours.
Short-term procedures useful for the discovery and characterization of natural product drugs, with related laboratory experiments, and principles of more advanced drug development. **Prerequisite(s):** Consent of the instructor.

499
Special Projects in Pharmacognosy 1 TO 3 hours.
Special topics in pharmacognosy dealing with isolation and characterization of natural products.

507
Drug Discovery, Design, and Development 3 hours.
Overview of drug development process from target identification and screening through clinical trials and FDA evaluation. **Same as** BPS 507 and MDCH 507.

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(s):** 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(s):** PMPG 517 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. **Same as** BCMG 513 and MIM 513. **Prerequisite(s):** GCLS 501 and one year of physical chemistry, or consent of the instructor.

515
Structure Elucidation of Natural Products I 2 hours.
Learn the basic skills needed to elucidate the structure of a natural product by spectroscopic methods by using real-life examples. May be repeated to a maximum of 6 hours. **Prerequisite(s):** Credit or concurrent registration in MDCH 562 and credit or concurrent registration in PMPG 511.

516
Structure Elucidation of Natural Products II 3 hours.
Employing modern computational methods in the structure elucidation and dereplication of a natural product by using real life examples. **Same as** MDCH 516. May be repeated. **Prerequisite(s):** PMPG 515.

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 fieldwork methods. **Prerequisite(s):** 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(s):** PMPG 517.

520
Ethnopharmacology Fieldwork 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. Contingent on availability of funds for travel support. **Prerequisite(s):** PMPG 517 or consent of the instructor.

521
Recent Advances in Pharmacognosy 2 hours.
A review of recent progress in the chemistry, biosynthesis, and biological properties of natural products. **Prerequisite(s):** PMPG 511.

522
Laboratory Techniques in Pharmaceutical Biotechnology I 3 hours.
Students will perform laboratory research rotations as assigned by the Biotechnology track faculty in the three laboratories of the Center for Pharmaceutical Biotechnology in the College of Pharmacy. **Prerequisite(s):** Credit or concurrent registration in BCHE 460; or consent of the instructor.

523
Laboratory Techniques in Pharmaceutical Biotechnology II 3 hours.
In a continuation of PMPG 522, students will perform laboratory research rotations as assigned by the Biotechnology track faculty in the laboratories of the Center for Pharmaceutical Biotechnology in the College of Pharmacy. **Prerequisite(s):** PMPG 522; or consent of the instructor.

534
Dental and Medical Anthropology Within Human Evolution 1 TO 3 hours.
Studies the biological and physical anthropology of hominid teeth and the craniofacial complex with relevant medical anthropology, ethnopharmacology, forensic sciences, and paleopathology topics. **Same as** ANTH 534 and OSCI 534. Fieldwork required. A lab experience, independent study, and a research paper are required for 3 hours of credit. **Prerequisite(s):** Graduate standing and consent of the instructor.

540
Marine Natural Products 2 hours.
Expose graduate students to field of marine natural product chemistry. Course will include examples of marine antineoplastic agents,

marine toxins, and other pharmaceutically relevant marine natural products from various marine organisms. May be repeated to a maximum of 6 hours.

565

Special Projects in Pharmacognosy 1 TO 3 hours.

Overview of current research topics of interest in pharmacognosy: potential areas—ethnomedicine, biological evaluation, dietary supplements, taxonomy, chemotaxonomy, organism propagation, and applications of contemporary analytical techniques. May be repeated up to 3 times.

Prerequisite(s): Completion of the first year of the program.

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.

Prerequisite(s): Demonstration of competency in organic chemistry, botany, and pharmacology.

590

Laboratory Techniques in Pharmacognosy I 2 hours.

Perform laboratory research rotations as assigned by Pharmacognosy drug discovery track faculty of Program for Collaborative Research in Pharmaceutical Sciences (PCRPS).

Prerequisite(s): Credit or concurrent registration in PMPG 510 or consent of the instructor.

592

Laboratory Techniques in Pharmacognosy II 2 hours.

In continuation of PMPG 590, student will perform lab research rotations as assigned by Pharmacognosy drug discovery track faculty of the Program for Collaborative Research in Pharmaceutical Sciences (PCRPS).

Prerequisite(s): PMPG 590 or consent of the instructor

595

Seminar in Pharmacognosy 1 hour.

Presentation on a current research topic. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours.

598

Master's Research in Pharmacognosy 0 TO 16 hours.

Research for completion of master's degree. Satisfactory/Unsatisfactory grading only.

599

Doctoral Research in Pharmacognosy 0 TO 16 hours.

Research for students in the pharmacognosy doctoral program. Satisfactory/Unsatisfactory grading only. May be repeated.

Pharmacology (PCOL)

430

Principles of Toxicology 2 hours.

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. **Same as** BPS 430. Credit is not given for PCOL 430 if the student has credit for EOHS 457.

501

Medical Pharmacology I 3 hours.

A lecture, conference, and laboratory course on human pharmacology. Drug mechanisms, toxicities, and kinetics are presented as a foundation to therapeutic application. This is a College of Medicine course that does not follow the regular academic calendar. Credit is not given for PCOL 501 if the student has credit for PCOL 425.

Prerequisite(s): Grade of C or better in GCLS 501 and grade of C or better in GCLS 503; or consent of the instructor.

502

Medical Pharmacology II 3 hours.

Continues PCOL 501. A lecture, conference, and laboratory course on human pharmacology. Drug mechanisms, toxicities, and kinetics are presented as a foundation to therapeutic application. Credit is not given for PCOL 502 if the student has credit for PCOL 425.

College of Medicine course that does not follow the regular academic calendar. **Prerequisite(s):** Grade of C or better in GCLS 501 and grade of C or better in GCLS 503; or consent of the instructor.

510

Molecular Pharmacology of Platelets, Thrombosis, and Vascular System 2 hours.

Molecular mechanism and therapeutic approaches to: platelet functions, thrombosis, hemostasis, and vascular biology. The platelet as a model cell for molecular mechanisms of intracellular signal transduction and cell adhesion.

Prerequisite(s): Credit or con-

current registration in GCLS 501 and GCLS 503; or consent of the instructor.

530

Pharmacology and Biology of the Vessel Wall 2 hours.

Regulation of physiological and pathological processes in the cardiovascular system: e.g., endothelial barrier, cell adhesion, smooth muscle proliferation, angiogenesis, endothelial gene expression.

Pharmacological treatment of cardiovascular diseases.

Prerequisite(s): Credit or concurrent registration in GCLS 501 and GCLS 503; and consent of the instructor.

540

Ion Channels: Structure, Function, Pharmacology, and Pathology 2 hours.

The concept of ion channels is treated from the perspectives of their molecular structures and functions. Modulation, pathological conditions (channelopathies), and pharmacological intervention will also be treated. **Same as** PHYB 540. **Recommended background:** One undergraduate course in biochemistry and one in physiology, or consent of the instructor.

594

Special Topics 1 hour.

Organized presentation and discussion of rapidly developing research areas in molecular, cellular, and systems pharmacology. May be repeated. **Prerequisite(s):** Consent of the instructor.

595

Pharmacology Seminar 1 hour.

Presentation of research and/or current literature by invited lecturers and students. Satisfactory/Unsatisfactory grading only. May be repeated.

598

MS Thesis Research 0 TO 16 hours.

Thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only.

599

PhD Thesis Research 0 TO 16 hours.

Thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only.

Pharmacy (PHAR)

400

Pharmacokinetics 3 hours.

Concepts and principles in pharmacokinetics including theories

and basis for drug receptor actions, drug absorption, distribution, excretion, and biotransformation. **Prerequisite(s):** Credit or concurrent registration in PHAR 322 and credit or concurrent registration in PHAR 332 and credit or concurrent registration in PHYB 302.

401

Principles of Drug Action and Therapeutics I 3 hours.

Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the drug actions related to the disease states associated with the endocrine, renal, optical, and auditory systems.

Prerequisite(s): PHYB 302 and PHAR 342 and PHAR 400 and second-year standing in the Doctor of Pharmacy program.

402

Principles of Drug Action and Therapeutics II 4 hours.

Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of the autonomic nervous system, cardiology, lipid disorders, and hypertension. **Prerequisite(s):** PHYB 302 and PHAR 342 and PHAR 400 and second-year standing in the Doctor of Pharmacy program.

403

Principles of Drug Action and Therapeutics III 3 hours.

Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of pain management and psychiatric disorders. **Prerequisite(s):** PHAR 352 and PHAR 401 and PHAR 402 and second-year standing in the Doctor of Pharmacy program or consent of the instructor.

404

Principles of Drug Action and Therapeutics IV 3 hours.

Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of women's and men's health, respiratory disorders, diabetes, and pediatrics. **Prerequisite(s):** PHAR 352 and PHAR 401 and PHAR 402 and second-year standing in the Doctor of Pharmacy program or consent of the instructor.





- 405 Principles of Drug Action and Therapeutics V 3 hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of drug abuse, cerebrovascular diseases, Parkinson's, and epilepsy. **Prerequisite(s):** PHAR 353 and PHAR 401 and PHAR 402 and third-year standing in the Doctor of Pharmacy program or consent of the instructor.
- 406 Principles of Drug Action and Therapeutics VI 3 hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the area of infectious disease. **Prerequisite(s):** PHAR 353 and PHAR 401 and PHAR 402 and third-year standing in the Doctor of Pharmacy program or consent of the instructor.
- 407 Principles of Drug Action and Therapeutics VII 4 hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of transplants, gastrointestinal disorders, body fluids, nutrition, and the impact of drug therapies on a geriatric person. **Prerequisite(s):** PHAR 353 and PHAR 401 and PHAR 402 and third-year standing in the Doctor of Pharmacy program or consent of the instructor.
- 408 Principles of Drug Action and Therapeutics VIII 3 hours.** Integration of medicinal chemistry, pharmacology, pharmacotherapeutics, pharmacokinetics, and toxicology in the areas of bones and joints, hematological disorders, and oncology. **Prerequisite(s):** PHAR 353 and PHAR 401 and PHAR 402 and third-year standing in the Doctor of Pharmacy program or consent of the instructor.
- 441 Roles, Environments, and Communications 3 hours.** Selected factors that influence pharmacists' practice, societal and professional expectations, and the importance of effective communications with a variety of patients and professional audiences. **Prerequisite(s):** Acceptance into the Doctor of Pharmacy program.
- 445 Pharmacy Law 3 hours.** Federal and state statutes and regulations pertaining to the

licensing of pharmacists, the practice of pharmacy, and distribution of drugs. Case law relating to the pharmacists' standard of care. **Prerequisite(s):** PHAR 342.

- 455 Drug Information and Statistics 4 hours.** Overview of drug information resources and statistics used in healthcare research, including systematic approaches for critical evaluation of the literature and effective communication of information. **Prerequisite(s):** PHAR 341.

Pharmacy Administration (PMAD)

- 421 Pharmaceutical Marketing 3 hours.** Introduction to the field of marketing with specific emphasis on pharmaceuticals and the marketing of pharmacy services.

- 470 Managed Care Pharmacy 3 hours.** Professional development in managed care pharmacy to learn history, administrative and policy aspects, network with operational managers and leaders in field, visit managed care sites and observe activities of managed care pharmacists. **Prerequisite(s):** Third-year standing in the Doctor of Pharmacy program or second-year standing in the Doctor of Pharmacy program with consent of the instructor, or graduate standing in pharmacy.

- 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.

- 484 Systematic Reviews and Meta-analysis 3 hours.** The course will discuss the concepts, process, and statistical methods required to perform a systematic review or meta-analysis of a large body of empirical findings. Extensive computer use required. **Prerequisite(s):** EPID 400 or BSTT 400 and PHAR 355 or PMAD 502 or graduate or professional standing or consent of the instructor.

- 494 Special Topics in Pharmacy Administration 1 TO 3 hours.** Topics will vary, including the ongoing analysis of contemporary issues associated with delivery,

financing, and management of pharmaceutical products and professional services. May be repeated to a maximum of 6 hours.

- 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. **Prerequisite(s):** 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(s):** Admission into the MS or PhD in Pharmacy program.

- 510 Problems in Pharmacy Management 3 hours.** Selective managerial problems relative to pharmacy practice. Fieldwork involves data collection based on individual and group models of the managerial decision process. **Prerequisite(s):** PMAD 482 or the equivalent.

- 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 interprofessional communication. **Prerequisite(s):** 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(s):** PPA 500.

- 573 Principles of Economic Evaluations of Healthcare Interventions 3 hours.** Principles, models, and practical methods for the economic evaluation of healthcare services with an emphasis on pharmaceutical care. **Same as** HPA 573. Previously listed as PMAD 571. **Prerequisite(s):** Graduate standing; and consent of the instructor.

- 594 Special Topics in Pharmacy Administration 1 TO 3 hours.** Topics vary. Intensive analysis of contemporary issue(s) associated with delivery and financing of pharmaceutical products and professional services. May be repeated to a maximum of 6 hours.

- 595 Departmental Seminar 1 hour.** Presentation by students, faculty, and visiting experts. Topics to be arranged. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

- 596 Independent Study 1 TO 4 hours.** Individual research under direction of a member of the faculty. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** PMAD 502 or consent of the instructor.

- 598 Master's Thesis Research 0 TO 16 hours.** Independent research on topic approved by student's graduate committee. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the committee. Open only to degree candidates.

- 599 PhD Thesis Research 0 TO 16 hours.** Independent research on topic approved by student's graduate committee. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the committee. Open only to degree candidates.

- Pharmacy Practice (PMPR)**
- 430 Critical Care I 2 hours.** Advanced pharmacotherapeutics course that will concentrate on the medical management and the pharmacist's role in the management of the critically ill patient. **Prerequisite(s):** PHAR 402 and PHAR 403 and PHAR 404 and PHAR 405 and PHAR 406; and completion of the second year of the program. Must enroll concurrently in PHAR 407 and PHAR 408.

Philosophy (PHIL)

400

Philosophical Writing 1 hour.

Philosophical issues covered will vary from semester to semester. Fulfills Writing-in-the-Discipline requirement. Must be taken in conjunction with designated 400-level courses. See the undergraduate adviser for details.

Prerequisite(s): Major in philosophy and concurrent registration in a 400-level philosophy course as designated in the Timetable.

401

Theory of

Knowledge 3 OR 4 hours.

Survey and analysis of key topics in epistemology, such as skepticism, the nature of propositional knowledge, justification, perception, memory, induction, other minds, and naturalistic epistemology. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** PHIL 201 or consent of the instructor.

403

Metaphysics 3 OR 4 hours.

Intensive treatment of one or more topics such as free will, personal identity, causation, existence, substance and attribute, and the nature of the mind. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 203 or PHIL 226 or PHIL 426 or consent of the instructor.

404

Philosophy of

Science 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 102 or PHIL 210, and one 200-level course in philosophy; or consent of the instructor.

406

Philosophy of

Language 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 102 or one 200- or 400-level logic course or PHIL 226 or consent of the instructor.

410

Introduction to

Formal Logic 3 OR 4 hours.

Review of predicate logic and of introductory set theory. The concept of a formal system. Notions of completeness and soundness. Introduction to Godel's first incompleteness theorem. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 210 or consent of the instructor.

416

Metalogic I 3 OR 4 hours.

Metatheory for sentence and predicate logic. Completeness and compactness theorems and their applications. 3 undergraduate hours. 4 graduate hours. Students who have taken MATH 430 may not register for this course. Should be taken in sequence with PHIL 417. **Prerequisite(s):** PHIL 210 or consent of the instructor.

417

Metalogic II 3 OR 4 hours.

Effective computability and recursive functions. Peano arithmetic. Arithmetization of syntax.

Incompleteness and undecidability: Godel's and Church's theorems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** PHIL 416 or consent of the instructor.

420

Plato 3 OR 4 hours.

Careful reading of selected works. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department. **Prerequisite(s):** PHIL 220 or PHIL 221 or 3 courses in philosophy or consent of the instructor.

421

Aristotle 3 OR 4 hours.

Careful reading of selected works. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department. **Prerequisite(s):** PHIL 220 or PHIL 221 or 3 courses in philosophy or consent of the instructor.

422

Medieval

Philosophy 0 TO 4 hours.

Study of selected philosophers such as Augustine, Boethius, Averroes, Maimonides, Aquinas, William of Ockham, Buridan, and Suarez. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** PHIL 220 or PHIL 221 or PHIL 420 or PHIL 421 or consent of the instructor.

423

Studies in

Early Modern

Philosophy 3 OR 4 hours.

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. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department.

Prerequisite(s): PHIL 223 or PHIL 224 or 3 courses in philosophy or consent of the instructor.

424

Kant 3 OR 4 hours.

Intensive study of Kant's metaphysics and theory of knowledge with main reading drawn from the Critique of Pure Reason. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 223 or PHIL 224 or 3 courses in philosophy or consent of the instructor.

425

Studies in Nineteenth-Century

Philosophy 3 OR 4 hours.

Careful reading of one or more post-Kantian philosophers such as Hegel, Schelling, Fichte, Schopenhauer, Marx, J.S. Mill, Kierkegaard, and Nietzsche. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** One 200-level course in philosophy or consent of the instructor.

426

Analysis and

Logical

Empiricism 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 210 or PHIL 226 or consent of the instructor.

427

Continental Philosophy II:

European Thought

Since 1960 3 OR 4 hours.

European thought since 1960: Existential Marxism; Critical Theory; Structuralism, Post-Structuralism and Deconstruction. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): PHIL 227 or consent of the instructor.

429

Special Studies

in the History of

Philosophy 3 OR 4 hours.

Advanced study of a historical school, period, or the development of a historical theme. 3 under-

graduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department.

Prerequisite(s): One 200-level course in the history of philosophy or consent of the instructor.

430

Ethics 3 OR 4 hours.

Selected topics in moral philosophy such as normative ethics, value theory, or metaethics. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department. **Prerequisite(s):** One 200-level course in philosophy or consent of the instructor.

Recommended background: Credit in a course in moral, social, or political philosophy.

431

Social/Political

Philosophy 3 OR 4 hours.

Selected topics in social and political philosophy. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department.

Prerequisite(s): One 200-level course in philosophy or consent of the instructor. **Recommended background:** Credit in a course in moral, social, or political philosophy.

432

Topics in Ethics 3 OR 4 hours.

Selected topics in ethics. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department.

Prerequisite(s): One 200-level course in philosophy or consent of the instructor. **Recommended background:** Credit in a course in moral, social, or political philosophy.

433

Topics in

Social/Political

Philosophy 3 OR 4 hours.

Selected topics in social and political philosophy. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department.

Prerequisite(s): One 200-level course in philosophy or consent of the instructor. **Recommended background:** Credit in a course in moral, social, or political philosophy.





441
Topics in
Philosophy of
Religion **0 TO 4 hours.**

Intensive study of one or more selected topics concerning the philosophical aspects of basic religious beliefs and concepts. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time with approval. Approval to repeat course granted by the department. **Prerequisite(s):** One 200-level course in philosophy or consent of the instructor. **Recommended background:** PHIL 241.

484
Neuroscience I **3 hours.**

Neuroscience as an integrative discipline. Neuroanatomy of vertebrates, neural development, cellular neurobiology, action potential mechanisms, synaptic transmission, and neuropharmacology. **Same as** BIOS 484 and PSCH 484. **Prerequisite(s):** BIOS 286 or PSCH 262.

485
Neuroscience II **3 hours.**

Integrative neuroscience. Continuation of BIOS/PSCH/PHIL 484. Sensory and motor systems; learning, memory, and language. Pathology of nervous systems. Philosophical perspectives and modeling. **Same as** BIOS 485 and PSCH 485. **Prerequisite(s):** BIOS 484.

500
Writing in
Philosophy **4 hours.**

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. Required of all first-year PhD students. **Prerequisite(s):** Graduate standing in philosophy.

501
Seminar: Topics in
Ancient Philosophy **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

503
Medieval Philosophy **4 hours.**

Intensive study of special topics in medieval philosophy. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

504
Theoretical Approaches to
Policy and
Governance **4 hours.**

Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based. **Same as** POLS 504. **Prerequisite(s):** Consent of the department required for nondegree graduate students.

505
Seminar in Modern
Philosophy **4 hours.**

Intensive analysis of the work of one important philosopher or philosophical movement between 1600 and 1900. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

508
Nineteenth-Century
Philosophy **4 hours.**

Topics in nineteenth-century philosophy. May be repeated with approval. Students may register for more than one section per term. Approval to repeat course granted by the department.

509
History of Analytic
Philosophy **4 hours.**

Topics in late-nineteenth- and early-twentieth-century Anglo-American philosophy. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

510
History of Ethics and
Social/Political
Philosophy **4 hours.**

Topics in the history of ethics or social-political philosophy. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

513
Topics in History of
Philosophy **4 hours.**

Philosophers, philosophical schools, or intellectual trends other than those of the ancient and modern periods. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

520
Topics in Contemporary
Philosophy **4 hours.**

Intensive analysis of the work of one important philosopher or philosophical movement of the twentieth century. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

522
Feminist Philosophy **4 hours.**

Topics in feminist philosophy. May be repeated with approval. Students may register for more than one section per term. Approval to repeat course granted by the department.

524
Continental
Philosophy **4 hours.**

Topics in continental philosophy. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

526
Ethics **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

528
Social/Political
Philosophy **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

530
Aesthetics **4 hours.**

Intensive study of selected topics in aesthetics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

532
Metaphysics **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

534
Philosophy of Mind **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

536
Epistemology **4 hours.**

Selected topics in the contemporary theory of knowledge. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

538
Philosophy of
Language **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

540
Philosophy of
Science **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

542
Philosophy of
Special Sciences **4 hours.**

Intensive study of special topics in philosophy of physics, philosophy of biology, or other sciences. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

544
Philosophy of Logic **4 hours.**

Intensive study of selected topics. May be repeated with approval. Approval to repeat course granted by the department. Students may register for more than one section per term when topics vary.

546
Philosophy of
Mathematics **4 hours.**

Philosophical foundations of mathematics. May be repeated with approval. Approval to repeat course granted by the department.

562
Metamathematics I **4 hours.**

First order logic, completeness theorem, and model theory. **Same as** MATH 502. **Prerequisite(s):** MATH 430 or consent of the instructor.

563
Metamathematics II **4 hours.**

Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. **Same as** MATH 503. **Prerequisite(s):** MATH 502 or PHIL 562.

565
Set Theory I 4 hours.
Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. **Same as** MATH 504.
Prerequisite(s): MATH 430 or MATH 502 or PHIL 562.

567
Model Theory I 4 hours.
Introduction to stability theory: categoricity, stability, forking, finite equivalence relation theorem, indiscernibles, orthogonality. **Same as** MATH 506.
Prerequisite(s): MATH 502 or PHIL 562.

568
Model Theory II 4 hours.
Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. **Same as** MATH 507.
Prerequisite(s): MATH 506 or PHIL 567.

569
Advanced Topics in Logic 4 hours.
Advanced topics in modern logic: e.g., descriptive set theory, model theory of fields, theory of hierarchies, stable groups. **Same as** MATH 512. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

590
Research Seminar 4 hours.
A work-in-progress seminar for graduate students at the topical, prospectus, or dissertation level. Satisfactory/Unsatisfactory grading only. May be repeated.
Prerequisite(s): Completion of 10 of the 14 required courses for the PhD in Philosophy.

593
Independent Research 2 TO 8 hours.
Topics and plan of study must be approved by the candidate's adviser and by the staff member who directs the work. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

596
Independent Study 1 TO 4 hours.
Topics and plan of study must be approved by the candidate's adviser and by the staff member who directs the work. May be repeated. Students may register in more than one section per term.

599
Thesis Research 0 TO 16 hours.
Research for the PhD thesis. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Physical Therapy (PT)

501
Science of Physical Therapy Practice 3 hours.
Concepts of evidenced-based physical therapy practice including practice theory, measurement, outcomes assessment, and critical evaluation of bodies of literature in context of the healthcare system and health policy.
Prerequisite(s): Consent of the instructor.

502
Measuring Motor Development and Function 3 hours.
Psychometric characteristics of standardized tests of motor development and function. Survey of tests, test evaluation, interpretation of test scores, and application to clinical practice.
Prerequisite(s): Consent of the instructor and a graduate-level course in statistics.

503
Analysis of Motor Development 3 hours.
Sensorimotor development in children, relating changes to maturation, skill acquisition, motor learning, environmental influences and individual differences. Includes critical review of current literature. **Prerequisite(s):** Consent of the instructor.
Recommended background: Prior experience in or knowledge of child development.

504
Assessment of Developmental Processes in Infancy 2 hours.
Motor and behavioral competencies of the newborn, both term and preterm. Assessment of behavior and motor dysfunction in infants; analysis of the literature on intervention. **Prerequisite(s):** Consent of the instructor and credit or concurrent registration in a graduate-level course in statistics.

510
Control of Posture and Locomotion 2 hours.
Review and analysis of normal and developmental aspects, assessment, disorders, and rehabilitation

of balance and gait disorders.
Prerequisite(s): PT 562; and consent of the instructor.

511
Therapeutic Intervention 3 hours.
Provides clinicians with an approach to integrate research into practice. The goal is to acquire skills to evaluate therapeutic interventions in the literature and in practice.
Prerequisite(s): 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(s): PT 519.

521
Biomechanics of Locomotor Dysfunction 3 hours.
Principles of mechanics applied to the study of walking pattern. Kinematic and kinetic analysis of normal and pathological deviations, and issues related to development from birth to adult and neuromuscular control.
Prerequisite(s): Consent of the instructor.

562
Neural Plasticity and Pathophysiology 3 hours.
Neurologic concepts underlying PNS/CNS injury process and neural plasticity (nervous system remodeling and reorganization). Neuropathology of conditions producing movement dysfunction.
Prerequisite(s): Consent of the instructor.

563
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(s): Consent of the instructor and any graduate-level statistics course.

570
Planning and Evaluating Intervention Programs in Various Settings 3 hours.
Planning, implementation, and evaluation of services for children with special needs. Emphasis on conceptual frameworks in human development and family systems. Program planning and evaluation.
Prerequisite(s): Consent of the

instructor. **Recommended background:** Prior experience or knowledge of child development.

571
Biomechanics of Normal and Abnormal Movement 3 hours.
Principles of statics and dynamics exemplified by human movements. Examination of muscle mechanics, joint forces, stability. Redundancy and intersegmental interactions in multijoint movements. **Same as** MVSC 571. **Prerequisite(s):** Consent of the instructor.

572
Psychology of Motor Control and Learning 3 hours.
Advanced principles of the control and acquisition of complex, voluntary skills. **Same as** MVSC 572.
Prerequisite(s): KINE 354; or consent of the instructor.

574
Instrumentation for Motor Control Research 3 hours.
Introduction to oscilloscopes, amplifiers, filters, and transducers. Origin and processing of electromyograms. Motion capture and processing techniques. **Same as** MVSC 574. **Prerequisite(s):** KINE 571 or PT 571.

594
Special Topics in Physical Therapy 1 TO 4 hours.
Selected topics of interest within physical therapy specialty areas. Particular attention is given to topics of cross cutting importance to these professions, especially applications in teaching, consultation, and administration. May be repeated to a maximum of 8 hours if topics vary. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595
Seminar in Physical Therapy 1 hour.
Topics of current interest in physical therapy. Includes discussions of current research and important new developments in the specific disciplines. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): Consent of the instructor.

596
Independent Study 1 TO 4 hours.
For graduate students who wish to pursue independent study not related to their project/thesis research. May be repeated to a maximum of 8 hours. Students may register in more than one section per term.



Prerequisite(s): Consent of the instructor.

598

Research in Physical Therapy 0 TO 16 hours.

Independent research in one area of physical therapy directed by a faculty member. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): 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. **Prerequisite(s):** PHYS 142 and PHYS 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(s): PHYS 401.

411

Quantum Mechanics I 4 hours.

Wave particle duality; wave functions; Schroedinger equation; mathematical structure of quantum mechanics; operators and observables; matrix representation of operators; three dimensional Schroedinger equation.

Prerequisite(s): PHYS 244.

412

Quantum Mechanics II 4 hours.

Orbital angular momentum. Spin and vector addition of angular momenta; degenerate and non-degenerate perturbation theory; identical particles; time-dependent perturbation theory; scattering theory. **Prerequisite(s):** 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(s): 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(s):** PHYS 244.

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.

Prerequisite(s): PHYS 411 and PHYS 461; or consent of the instructor.

441

Theoretical Mechanics 4 hours.

Variable motion, noninertial frames, oscillations, rigid body motion, three-dimensional motion, angular momentum, torque, orbits, Lagrange's equations.

Prerequisite(s): PHYS 142 and PHYS 215.

450

Molecular Biophysics of the Cell 4 hours.

Introduction to molecular length, time, force, energy scales; statistical thermodynamics of solutions; DNA, RNA, and protein structure and function; experimental methods. **Same as** BIOE 450.

Prerequisite(s): PHYS 245 or the equivalent.

451

Modern Physics: Nuclei and Elementary Particles 4 hours.

Accelerators, detectors, symmetries, conservation laws, leptons, weak interactions, electroweak theory, strong interactions, hadrons, nuclear forces, systematics and reactions, nuclear models, nuclear astrophysics, quarks, quantum chromodynamics.

Prerequisite(s): 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(s): PHYS 245.

470

Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

471

Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department.

Prerequisite(s): Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in PHYS 470, and approval of the department.

481

Modern Experimental Physics I 4 hours.

Theory and experimental use of linear circuits, semiconductor devices, amplifiers, oscillators. Techniques and experiments in atomic, molecular and solid-state physics.

Prerequisite(s): 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(s): PHYS 481.

491

Special Topics in Physics 1 TO 4 hours.

Selected topics of current interest in physics. May be repeated.

Prerequisite(s): PHYS 215 and sophomore standing or above; or approval of the department.

494

Special Topics in Physics Teaching 2 TO 4 hours.

Seminar on various topics related to the teaching of physics. Subjects are announced. May be repeated. Students may register in more than one section per term. Supervised teaching practice

included. **Prerequisite(s):**

Graduate standing or approval of the department.

499

Survey of Physics Problems 1 hour.

Problem-solving techniques applied to the variety of undergraduate physics topics. May be repeated up to 1 time. No graduation credit for graduate students. Grade of C or better required to graduate with an undergraduate degree in physics.

Prerequisite(s): Credit or concurrent registration in PHYS 401 and PHYS 411 and PHYS 441 and PHYS 461 and PHYS 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(s): PHYS 402 or approval 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(s): PHYS 501 or consent of the department.

511

Quantum Mechanics I 4 hours.

Linear operators, vector spaces. Schroedinger equation. Heisenberg formalism. Multi/identical particle systems, approximation methods, perturbation theory, symmetries and groups, conservation laws, angular momentum, spin. Wigner-Eckart theorem. **Prerequisite(s):** PHYS 412 or approval 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(s):** PHYS 511 or approval 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(s): PHYS 512.



514
Quantum Field Theory II 3 hours.
Path integrals, gauge theories, Weinberg-Salam model, electroweak processes, quantum chromodynamics, nonperturbative methods, topological objects in field theories, instantons.
Prerequisite(s): 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(s): PHYS 215.

521
Molecular Physics 3 hours.
Rotational and vibrational energies of molecules, potential curves, electronic transitions, transition moments, intensity rules, thermodynamic properties. Applications.
Prerequisite(s): PHYS 411 and PHYS 421; or approval 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(s): PHYS 521 or approval of the department.

524
Group Theory in Physics 3 hours.
Applications of group theory and symmetry principles to problems in elementary particle, solid-state, atomic, and molecular physics.
Prerequisite(s): PHYS 512 or approval 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. **Prerequisite(s):** PHYS 412 AND PHYS 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(s): 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. **Prerequisite(s):** PHYS 512 and PHYS 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, nonequilibrium Green's functions, Keldysh, Kadanoff-Baym approach.
Prerequisite(s): PHYS 512 and PHYS 532.

540
Physics of Semiconductor Devices 4 hours.
Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions, in homogeneous semiconductors; recombination and generation; nonequilibrium processes, radiation and electric fields; diodes. **Same as** ECE 540. **Prerequisite(s):** ECE 346 or the equivalent.

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.
Prerequisite(s): PHYS 502 and PHYS 541 or approval 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(s):** PHYS 512 or approval 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(s): PHYS 551 or approval of the department.

561
Statistical Mechanics 3 hours.
Density matrix. Information theory; Boltzmann-Gibbs distribution; the n-vector model; renormalization group theory; cellular automata.
Prerequisite(s): PHYS 461 or approval of the department.

581
Advanced Experimental Physics 2 hours.
Experimental techniques in atomic, molecular and solid-cular and solid-state physics.
Prerequisite(s): PHYS 431 or consent of the instructor.

594
Special Topics in Modern Physics 1 TO 4 hours.
Lectures on topics of current interest. Subjects are announced in the previous semester. May be repeated. Students may register in more than one section per term.
Prerequisite(s): PHYS 512.

595
Graduate Seminar 1 hour.
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. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. Students may register in more than one section per term.

596
Individual Study 2 TO 4 hours.
Special topics. Outside reading and a term paper are assigned by a special arrangement with the department and faculty.
Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.
Prerequisite(s): Approval of the department.

598
Master's Thesis Research 0 TO 16 hours.
Student may elect to do thesis research to fulfill partial requirement for master's degree.
Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Approval of the department.

599
Thesis Research 0 TO 16 hours.
PhD thesis research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Approval of the department.

Physiology and Biophysics (PHYB)

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
Receptors and Signal Processing 3 hours.
Lecture/discussions of theoretical and experimental aspects of cellular receptors and signaling processes. Topics include drug receptor theory and signal transduction mechanisms. **Same as** PCOL 505. **Prerequisite(s):** BCHE 460 or consent of the instructor.

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(s): PHYB 402 or consent of the instructor.

516
Physiology and Biochemistry of Muscle Contraction 2 hours.
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(s): PHYB 401 or consent of the instructor.

523
Exercise Biology in Health and Disease 3 hours.
Interrelationships between exercise and various pathological conditions. Current research focusing on molecular and cellular mechanisms in healthy and diseased states. **Same as** MVSC 523.
Prerequisite(s): Consent of the instructor.



540
Ion Channels: Structure, Function, Pharmacology, and Pathology 2 hours.

The concept of ion channels is treated from the perspectives of their molecular structures and functions. Modulation, pathological conditions (channelopathies), and pharmacological intervention will also be treated. **Same as** PCOL 540. **Recommended background:** One undergraduate course in biochemistry and one in physiology, or consent of the instructor.

551
Human Physiology I 5 hours.

Lectures and conferences in human physiology. Emphasis is on cellular, nerve-muscle, cardiovascular, respiratory, and renal physiology. **Prerequisite(s):** Mathematics, undergraduate physics, and organic chemistry; or consent of instructor.

Recommended background: Course work in biological sciences.

552
Human Physiology II 5 hours.

Continuation of PHYB 551. Emphasizes gastrointestinal and physiology of the central nervous system, endocrine, and reproductive systems. **Prerequisite(s):** A grade of C or better in PHYB 551 or consent of the instructor.

Recommended background: Course work in biological sciences.

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.

Prerequisite(s): Enrollment in the MS or PhD in Physiology and Biophysics program, and credit or concurrent registration in PHYB 401 or the equivalent; or consent of the instructor.

585
Cell Biology 4 hours.

Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. **Same as** ANAT 585 and MIM 585.

586
Cell Physiology 3 hours.

Advanced functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

Prerequisite(s): PHYB 552 and GCLS 501 and GCLS 503; or consent of the instructor.

591
Departmental Seminar 1 hour.

Weekly seminar by staff and invited speakers. Satisfactory/Unsatisfactory grading only. May be repeated. Required of all physiology and biophysics students each fall and spring semester while enrolled in the graduate program. **Prerequisite(s):** 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(s):** PHYB 401.

594
Special Topics in Physiology and Biophysics 1 TO 4 hours.

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. May be repeated.

Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595
Journal Club and Seminar in Physiology 1 hour.

Student presentation and discussion of assigned topics of current importance in physiology and biophysics as well as related fields. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor. Limited to degree candidates in physiology and biophysics.

596
Independent Study 1 TO 4 hours.

Individual study guided by a faculty member. The format of the course, examination and grading to be established by the faculty member. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor.

598
MS Thesis Research 0 TO 16 hours.

Thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Graduate standing in Physiology and Biophysics.

599
PhD Thesis Research 0 TO 16 hours.
Thesis work under the supervision of a graduate adviser. Satisfactory/Unsatisfactory grading only.

Policy Studies (PS)

453
Topics in Education Policy 3 OR 4 hours.

Workshop; emphasis on issues related to school organization, control, and community relations. Topics are announced at the time the class is scheduled. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Advanced undergraduate or graduate standing.

500
City Schools: The Urban Educational Environment 4 hours.

Cross-disciplinary, critical analysis of relationships between public schools and their urban contexts, with attention to implications for school improvement.

Prerequisite(s): Consent of the instructor.

501
School Finance and Policy Analysis 4 hours.

Role of government, school boards, and community in funding education. Principles of school and district financial planning, management, and analysis. Equity issues in school finance.

Prerequisite(s): Consent of the instructor.

510
Seminar in Urban Education 4 hours.

This required doctoral seminar will be taken in the first year of doctoral study. It introduces theoretical perspectives and research problems in both concentrations of the PhD program as well as relation between educational and social change. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor or admission to the PhD in Policy Studies in Urban Education program.

512
The Nature and Interpretation of Evidence in Educational Policy Research 4 hours.

This required course in educational research methodology pro-

vides students with basic research tools and skills in interpreting and representing quantitative and qualitative data. Students learn research design and critique.

Prerequisite(s): ED 500 and enrollment in the PhD in Policy Studies in Urban Education program or consent of the instructor.

544
Research Design 4 hours.

Alternative research design models and evaluation methodologies; quantitative and qualitative approaches; ethnography; historiography; experimentation and quasiexperimentation; institutional and practitioner research designs and methods. May be repeated.

Prerequisite(s): Admission to the PhD in Policy Studies in Urban Education (Educational Organization and Leadership Concentration) or the EdD in Urban School Leadership Program and consent of the instructor.

548
Leadership for Literacy Instruction 4 hours.

School and system leadership practices for promoting effective literacy instruction in urban elementary and secondary schools. Assessment and improvement of literacy curriculum, pedagogy, and evaluation. **Same as** CIE 548.

Prerequisite(s): Consent of the instructor; admission to a degree program in the College of Education. Students admitted to the EdD in Urban Education Leadership, prerequisites also include PS 550 and PS 552.

549
Teaching for Social Justice in K-12 Schools: Theory and Practice 4 hours.

Examine theory and practice of social justice teaching in schools, including: history liberatory pedagogies, culturally relevant and critical pedagogies, funds of knowledge, critical multiculturalism and antiracist pedagogy, critical race theory. **Same as** CIE 549. **Prerequisite(s):** Consent of the instructor.

550
Organizational Leadership and Change in Education 4 hours.

Introduction to models and theories of organizational leadership and change in education. Overview of mechanisms, resources, and contexts of effective school improvement. **Prerequisite(s):** Consent of the instructor.

552

The Urban School Principal 4 hours.

Leadership and management responsibilities of principals in urban schools. Theory and research on principal leadership, case study analysis, and field experience with working principals. **Prerequisite(s):** Consent of the instructor.

553

System Leadership in Urban Schools 4 hours.

Leadership and management responsibilities of system administrators in urban school systems. Theory and research on system level leadership using case study analysis and fieldwork with system administrators. **Prerequisite(s):** Consent of the instructor.

555

Politics of Urban Education 4 hours.

Politics of urban school policy and practice. Interest groups, school boards, educators, citizens, and governments as political actors. Educational leadership in political context. **Prerequisite(s):** Consent of the instructor.

556

Instructional Leadership 4 hours.

Instructional improvement role of educational leaders of urban schools. Human resource development, parent/community support, supportive organizational contexts. Strategic planning, implementation, and evaluation.

Prerequisite(s): Consent of the instructor.

559

Internship in Educational Leadership 4 hours.

Field experience in approved educational leadership positions and sites to perform authentic leadership tasks. Supervision by site-based mentor and university instructor. Different sections will focus on school-level and system-level administration. May be repeated. 4 hours required for the Illinois Type 75 certificate.

Additional hours may be needed for students to satisfy local school system administrator certification requirements (such as Chicago Public School's 1019 requirement). **Prerequisite(s):** PS 550 and PS 552 and admission to a degree program in the College of Education and to the Type 75 General Administrative Certificate program, and consent of the instructor. Requires concurrent registration in PS 573.

566

Cultural Studies in Education 4 hours.

Examines origins, evolutions, and current cultural studies frameworks, with a focus on educational policy and practice.

Prerequisite(s): Consent of the instructor or admission to the PhD in Policy Studies in Urban Education program.

567

Economics of Education and Public Policy: An Introduction 4 hours.

Introduction to the economics of education. It relates education and income, studies and conditions for efficient production of education, teacher markets and school finance. **Prerequisite(s):** Consent of the instructor or admission to the PhD in Policy Studies in Urban Education program.

568

Education and the Law 4 hours.

Legal rights, responsibilities, and authority of students, parents, teachers, administrators, boards, and government units in relation to schools. Legal issues in education policy and practice.

Prerequisite(s): 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(s):** 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(s):** Consent of the instructor.

572

Sociology of Education 4 hours.

Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education, inequality, and educational reform. **Same as** SOC 572. **Prerequisite(s):** Enrollment in

the PhD in Policy Studies in Urban Education program or consent of the instructor.

573

Seminar in Administrative Practice 4 hours.

Budget and finance, strategic planning and decision making, communication, use of data and technology, parent/community relations, student support services. Different sections will focus on school-level and system-level administration. May be repeated. 4 hours is required for the Illinois Type 75 certificate. Additional hours may be needed for students to satisfy local school system administrator certification requirements (such as Chicago Public School's 1019 requirement).

Prerequisite(s): PS 550 and PS 552 and admission to a degree program in the College of Education and to the Type 75 General Administrative Certificate program, and consent of the instructor. Requires concurrent registration in PS 559.

574

The Impact of College on Students 4 hours.

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. **Same as** PPA 574. **Prerequisite(s):** Consent of the instructor.

575

Higher Education Organization and Administration 4 hours.

Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. **Same as** PPA 575. **Prerequisite(s):** Admission to PhD in Public Policy Analysis program or consent of the instructor.

576

History of Higher Education 4 hours.

Key historical events which have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. **Same as** PPA 576. **Prerequisite(s):** Admission to PhD in Public Policy Analysis program or consent of the instructor.

577

American Academic Profession 4 hours.

Historical and systemic foundations of the academic profession.

Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. **Same as** PPA 577. **Prerequisite(s):** Admission to the PhD in Public Policy Analysis program and consent of the instructor.

578

Theoretical Frameworks of Educational Politics 4 hours.

Basic concepts, hypotheses, research findings, and theory development. Nature and function of theory in educational politics at the federal, state, and local levels.

Prerequisite(s): 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(s):** PS 550 or consent of the instructor.

581

Unions and Collective Bargaining in Education 4 hours.

Role of unions, professional associations, and collective bargaining in governance, function, and improvement of school systems. Models and processes of negotiation, engagement, and conflict resolution. **Prerequisite(s):** Consent of the instructor.

582

Cultural Pluralism and Education Policy 4 hours.

Social philosophical analysis of the theory of cultural pluralism, its relation to the liberal-experimentalist tradition in educational thought; selected equal educational opportunity policies; recent federal and state legislation on multicultural education.

Prerequisite(s): Consent of the instructor.

583

Women in Education 4 hours.

An overview of girl's and women's educational experiences and placement within the academic structure (as students, professionals, and intellectuals). The impact of gender on the realization of educational, economic, and social opportunities. **Same as** GWS 583. **Prerequisite(s):** Consent of the instructor or enrollment in the PhD in Policy Studies in Urban Education program.





586
Methods of Institutional and Practitioner Research 4 hours.
Methods of institutional and practitioner research for practicing educators in school and school system settings. Use of this form of inquiry in educational leadership and improvement. **Prerequisite(s):** Admission to a doctoral program in the College of Education and consent of the instructor.

587
Topics in Documentary and Field Research in Education 4 hours.
Study and practice in documentary and field research methods of collecting, organizing, and integrating educational data: interviewing, participant observation, ethnography, case study, historiography. Topics vary. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

588
Critical Race Theory: Race and Racism in Education 4 hours.
Examines theories of race and racism in education within the interdisciplinary construct of Critical Race Theory. **Prerequisite(s):** Consent of the instructor or admission to the PhD in Policy Studies in Urban Education program.

589
Educational Administration Theory 4 hours.
Overview of administrative theory, including theory functions; theory practice interface; administrative theory history; and relationships of administrative theory to educational administration and organizations. **Prerequisite(s):** PS 550 or consent of the instructor.

592
Professional Career Training in Education Policy 4 hours.
Faculty supervised training through university teaching, research, or internship. Presentation relating experience to theory. May be repeated to a maximum of 16 hours. **Prerequisite(s):** Consent of the instructor.

593
PhD Research Project 1 TO 8 hours.
Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. May be repeated to a maximum of 8 hours.

imum of 8 hours. **Prerequisite(s):** Admission to the PhD in Education program.

594
Special Topics in Educational Policy 4 hours.
Exploration of an area not covered in existing course offerings. Topics vary. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596
Independent Study 1 TO 4 hours.
Students carry out independent study in policy studies under the direction of a faculty member. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the adviser and the area chairperson.

599
Thesis Research 0 TO 16 hours.
Research on the topic of the student's dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the dissertation adviser.

Polish (POL)

401
Polish Composition and Conversation III 3 OR 4 hours.
Development of oral and writing skills: expanding vocabulary and perfecting style. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POL 302.

402
Polish Composition and Conversation IV 3 OR 4 hours.
Continues POL 401. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POL 401 or the equivalent.

410
Structure of Modern Polish 3 OR 4 hours.
A synchronic linguistic analysis of Polish substantives, pronouns, verbs, deverbal nouns, and minor parts of speech from a syntagmatic and paradigmatic point of view. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POL 402 or the equivalent.

450
Studies in Polish Drama 3 OR 4 hours.
Main trends in Polish drama, leading playwrights, their aesthetics and philosophy in the context of European drama and from the

Renaissance to the present. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** Advanced undergraduate standing.

460
Studies in Polish Literature 3 OR 4 hours.
Literary trends in Polish poetry and prose; their poetics, aesthetics, and philosophy in their European context. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** Advanced undergraduate standing.

499
Independent Study 1 TO 4 hours.
Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Graduate students may register for more than one section per term. **Prerequisite(s):** Senior or graduate standing, consent of the instructor, and consent of 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(s):** POL 410 or the equivalent.

515
Topics in Contemporary Polish Linguistics 4 hours.
Variable content. May be repeated to a maximum of 12 hours.

520
Topics in Historical Polish Linguistics 4 hours.
Variable content. May be repeated to a maximum of 12 hours.

545
Studies in Polish Medieval, Renaissance, and Baroque Literature 4 hours.
Study of a topic, genre, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

550
Studies in Polish Enlightenment and Romanticism 4 hours.
Study of an author, topic, genre, or movement. Content varies. May be repeated to a maximum of 12 hours.

560
Studies in Polish Positivism and Symbolism 4 hours.
Study of an author, topic, genre, or movement. Content varies. May be repeated to a maximum of 12 hours.

565
Studies in Twentieth-Century Polish Literature 4 hours.
Study of an author, topic, genre, or movement. Content varies. May be repeated to a maximum of 12 hours.

570
Studies in Polish Literary Criticism 4 hours.
Literary criticism in the major epochs of Polish literary history. May be repeated to a maximum of 12 hours.

596
Independent Study 1 TO 4 hours.
Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and consent of the head of the department.

Political Science (POLS)

401
Data Analysis I 3 OR 4 hours.
Statistical inference for the social sciences. Emphasis on univariate and bivariate statistics. **Same as** PPA 401. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POLS 200 and POLS 201; or graduate standing.

405
The Problem of Justice 3 OR 4 hours.
Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. **Same as** CRJ 405. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** CRJ 101, plus two 200-level courses in criminal justice or two 200-level courses in political science.

435
Special Topics in Bureaucracy 3 OR 4 hours.
Consideration of timely or enduring issues in policy formation and bureaucracy not available in regularly offered courses. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. **Prerequisite(s):** POLS 460 or consent of the instructor.



451 Law and Public Policy 3 OR 4 hours.
The role of law and legal institutions in the development and implementation of public policies. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Graduate standing or consent of the instructor.

465 Topics in Sociology of Politics 3 OR 4 hours.
Intensive examination of a specialized topic announced when the class is scheduled. **Same as** SOC 465. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

467 Public Opinion and Political Communication 3 OR 4 hours.
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. **Same as** COMM 467. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POLS 200 or the equivalent or consent of the instructor.

482 Democratic Theory 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POLS 290 or POLS 291 or consent of the instructor.

485 Gender and Politics 3 OR 4 hours.
Impact of gender on basic categories of western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. **Same as** GWS 485. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** POLS 190 and one 200-level course in political theory; or consent of the instructor.

497 Directed Readings in Political Science 4 hours.
Intensive readings on a topic not covered in regular curriculum. May be repeated with approval.

Approval of the graduate director required to repeat course. **Prerequisite(s):** Graduate standing and consent of the instructor.

498 Independent Research in Political Science 2 TO 6 hours.
Research on special problems not included in course offerings. May not duplicate work done in POLS 598 or POLS 599. May be repeated with approval. Approval of the graduate director required to repeat course. **Prerequisite(s):** Graduate standing and consent of the instructor.

500 Introduction to Policy and Governance 4 hours.
Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored. **Same as** PPA 500. **Prerequisite(s):** Consent of the department required for nondegree graduate students.

501 Data Analysis II 4 hours.
Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. **Same as** PPA 501. **Prerequisite(s):** POLS 401 or PPA 401.

502 Time Series Analysis for Political Science 4 hours.
Single series (ARIMA) models, event history analysis, Vector autoregression (VAR), panel and pooled models. **Prerequisite(s):** POLS 402 or consent of the instructor.

504 Theoretical Approaches to Policy and Governance 4 hours.
Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based. **Same as** PHIL 504. **Prerequisite(s):** Consent of the department required for nondegree graduate students.

505 Research Design and Methods 4 hours.
Overview of the methods and conduct of research in political science. Issues of inference, measurements, data collection, hypothesis testing, and ethics.

506 The Profession of Political Science 2 hours.
Introduces graduate students to the range of teaching, research, and service possibilities in the political science profession. Students are encouraged to take this course during their first year of graduate study.

510 Seminar on Teaching Political Science 2 hours.
Seminar on ethics and responsibilities of teaching political science in various academic settings. Teaching methods and technology applicable to community colleges and four-year colleges. Complements the Preparing Future Faculty Program. The format will include guest speakers from area community and four-year colleges. Satisfactory/Unsatisfactory grading only.

541 Policy Formation, Implementation, and Evaluation 4 hours.
Introduction to political science theories of how elections, interest groups, and state structure affect the formulation of public solutions to societal problems. **Same as** PPA 541. **Prerequisite(s):** Consent of the department required for nondegree graduate students.

542 Distributive/Redistributive Public Policy 4 hours.
Seminar on the politics of enacting and maintaining distributive policies. Focus is on the parochial and community-wide efficiency of such policies.

544 Regulatory Public Policies 4 hours.
Exploring the nature and determinants of public policy making with respect to the regulation of the economy.

549 Topics in Public Policy Analysis 4 hours.
A research seminar on some aspects of public policy analysis not otherwise covered in the regular curriculum.

551 Introduction to Urban Politics 4 hours.
Explores relationships between private economy and public policies in American cities; causes of urban decline and uneven development; and urban redevelopment and human capital policies.

553 Urban Public Policy 4 hours.
Explores the problems of poverty, race, education, transportation policy, and housing in America's cities with a special emphasis on Chicago.

558 Graduate Student Field Experience in Political Science 1 TO 8 hours.
Graduate student intern experience. Placement with government agencies, community organizations, or civic organizations, in conjunction with a seminar class and directed readings. May be repeated up to 8 times. Students may register in more than one section per term. Fieldwork required. **Prerequisite(s):** POLS 402 and POLS 500.

559 Topics in State and Local Government 4 hours.
Case analysis and research in selected problems dealing with structure, functions, and administrative processes of American state and local governments. **Prerequisite(s):** POLS 500 and POLS 541.

560 Proseminar in American Politics 4 hours.
Introduction to research literature on American policy-making institutions and processes. **Prerequisite(s):** Consent of the instructor.

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(s):** POLS 541.

563 Executive Process 4 hours.
Presidential elections; presidential decision making; the powers of the president; presidential leadership; the distributive state; policy implementation; federalism and administration; the politics of budgeting. **Prerequisite(s):** Admission to the MA 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(s):** POLS 460.



566 Interest Groups 4 hours.
Pluralism: the distributive state; radical group theory, public-interest groups; collective actions; corporatism; statism; structural Marxism; social movements and interest groups.

567 Topics in Political Communication 4 hours.
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.
Same as COMM 567 and PA 567. **Prerequisite(s):** Consent of the instructor.

569 Topics in American Political Processes 4 hours.
A research seminar on some aspect of American political process. Topics vary. **Prerequisite(s):** POLS 402 and POLS 500.

570 Comparative Politics and Public Policy 4 hours.
Comparative analysis of how different political systems deal with a variety of public policy issues, such as environmental protection, social welfare, and crime control.

571 Seminar in International Relations 4 hours.
State building and challenges to state authority, democratization and regime change, political economy, environment, war, regionalism and globalization, social movements, and international governance.

572 International Political Economy 4 hours.
Exploration of competing perspectives on nation-states and economic systems. Previously listed as POLS 472.

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. **Prerequisite(s):** POLS 500 and POLS 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.
Interdisciplinary workshop on preparing a dissertation proposal for public policy analysis students. **Same as** PPA 590. **Prerequisite(s):** Advanced standing in the PhD in PPA program and completion of PPA core courses.

593 Independent Research for Master's Degree 2 hours.
Under the supervision of two faculty members, students will complete a major research paper that combines a review of relevant literature of a political science topic with analysis of original data or research materials. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** POLS 401 and POLS 505 and POLS 506; and POLS 541 or POLS 504 or POLS 551 or POLS 570 or POLS 571. Open only to Master's degree students and; approval of the department.

596 Advanced Readings in Political Science 1 TO 4 hours.
Intensive readings on an advanced topic not covered in the regular curriculum. May be repeated with approval. Students may register in more than one section per term. Approval to repeat course granted by the graduate director.
Prerequisite(s): POLS 401 and POLS 404 and consent of the instructor.

598 Research 0 TO 16 hours.
Individual study required of all students pursuing advanced degree in political science under thesis option. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor. Open only to degree candidates.

599 Dissertation Research 0 TO 16 hours.
Individual study required of all students pursuing PhD degree with specialization in political science. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor. Open only to degree candidates.

Prosthodontics (PROS)

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.
Prerequisite(s): REST 320, REST 321, REST 322, REST 323, REST 330, or the equivalent course work 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.
Prerequisite(s): Matriculation into the Advanced Certificate in Advanced Prosthodontics program or the MS in Oral Sciences program and consent of the department head.

Psychiatric Nursing (NUPS)

400 Group Dynamics, Behavior, and Intervention 2 TO 3 hours.
Concepts, theories, and research pertaining to group dynamics and to interventions carried out in groups. Analysis of videotaped group experience. Master of Science degree-seeking students in the Mental Health Nursing Concentration must register for 3 hours of credit.
Prerequisite(s): Graduate standing or consent of the instructor.

515 Developmental, Behavioral Health and Interventions with Youth 3 hours.
Normative and atypical developmental processes. Applications emphasize developmentally and culturally sensitive nursing assessment and intervention in children's lives to improve mental health outcomes. **Prerequisite(s):** NUSC 527 or consent of the instructor.

516 Behavioral Healthcare I 3 hours.
Common mental health problems presented in primary and community care settings. Focus on psychopathology, assessment, and brief counseling interventions; crisis intervention and triage; emergency care. **Prerequisite(s):** Consent of the instructor.

517 Behavioral Healthcare II 3 hours.
Complex mental health problems experienced in psychiatric populations. Focus on stabilization and management of psychotic illnesses, dual diagnosis treatment models, psychoeducational models, and psychiatric rehabilitation.
Prerequisite(s): NUPS 516.

518 Family Behavioral Health 2 hours.
Theories of family development and behavior; functional and dysfunctional communication and behavioral patterns. Theories and strategies for family assessment and intervention. **Prerequisite(s):** Consent of the instructor.

521 Clinical Practicum in Behavioral Health I 3 TO 5 hours.
Advanced nursing management of common mental health problems. Emphasis on primary care and community settings. Assessment, triage, case management, emergency care, and brief interventions. May be repeated. **Prerequisite(s):** Credit or concurrent registration in NUPS 517.

522 Clinical Practicum in Behavioral Health II 3 TO 8 hours.
Advanced psychiatric nursing with a selected caseload of clients with serious and complex problems. Emphasis on psychiatric rehabilitation, cognitive-behavioral methods, psychoeducation and dual diagnosis. May be repeated.
Prerequisite(s): NUPS 521.

523 Clinical Practicum in Behavioral Health III 2 TO 5 hours.
Development of mental health nurse practitioner role to deliver mental health services and impact policies affecting a selected population. May be repeated.
Prerequisite(s): NUPS 522 or consent of the instructor.

547 Substance Misuse and Dependence 2 hours.
Theories, research trends, treatment perspectives, ethical and social issues related to alcohol and other drug misuse and dependence. **Prerequisite(s):** 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(s):** Graduate standing in psychology or consent of the instructor.

415 Social Bases of Health Behavior 3 hours.
Psychological theory and research concerning the coronary-prone personality, pain management, controlling adherence to medical regimens, biofeedback, smoking, and weight control. **Prerequisite(s):** PSCH 270 and consent of the instructor, or graduate standing.

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(s):** PSCH 312 or consent of instructor.

420 Social Development of Urban Children 3 OR 4 hours.
General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles. **Same as** EPSY 420. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Admission to a graduate program in education or psychology, or consent of the instructor.

422 Advanced Developmental Psychology and Educational Processes 3 hours.
Focuses on cognitive and social development from birth to adolescence. Examines relations between development, learning, and educational processes. **Same as** ED 422. **Prerequisite(s):**

PSCH 100 and any one from ED 210, PSCH 259, PSCH 320; or graduate standing and consent of the instructor.

423 Characteristics of Early Adolescence 3 hours.
Physiological, social, emotional, and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. **Same as** EPSY 446. **Prerequisite(s):** ED 210 or ED 421 or ED 422 or PSCH 422 or the equivalent, and approval of the College of Education; or admission to the PhD in Psychology program; or consent of the instructor.

429 Constructivist Approaches to Development: Piaget and Vygotsky 3 OR 4 hours.
Piaget's and Vygotsky's theories of development of knowledge. Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language. **Same as** EPSY 429. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** ED 422 or PSCH 422 or the equivalent and graduate standing in education or graduate standing in psychology or consent of the instructor.

443 Advanced Statistics 3 hours.
Design and analysis of experiments between, within factorial and mixed factorial designs and introduction to multiple regression. For students planning research careers or advanced degrees. **Prerequisite(s):** PSCH 343.

452 Cognitive Psychology of Memory and Attention 3 hours.
A survey of empirical research and theories concerning the human memory system and the encoding, retention, retrieval of information in that system and research and theories of attention. **Prerequisite(s):** Graduate standing; or PSCH 352 and consent of the instructor.

454 Cognitive Psychology of Language 3 hours.
Provides students with a survey of methods, theory, and research in language and discourse processing. **Same as** COMM 454 and LING 474. **Prerequisite(s):** Graduate standing or consent of the instructor.

455 Cognitive Psychology of Thinking 3 hours.
Introduce students to research and theory concerning higher mental processes, including problem solving, reasoning, judgment, and decision making. **Prerequisite(s):** Graduate standing; or PSCH 352 and consent of the instructor.

457 Cognitive Psychology of Skill and Knowledge Acquisition 3 hours.
The course approaches learning from a variety of cognitive perspectives. The instruction is organized around discussions of original research articles. **Prerequisite(s):** Previous knowledge of cognitive psychology (with at least an undergraduate survey course) or admittance into the Cognitive Division graduate program.

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. **Prerequisite(s):** Graduate standing or consent of the instructor.

460 Advanced Learning 3 hours.
Methods, results, and interpretation of experimental studies of basic learning processes in animal and human subjects. **Prerequisite(s):** Graduate standing; or PSCH 360 and PSCH 361 and consent of the instructor.

462 Neural Basis of Learning and Memory 3 hours.
Theory and research on the anatomical, electrophysiological, and chemical bases of learning and memory in humans and other animals. **Prerequisite(s):** Graduate standing; or PSCH 262 and consent of the instructor.

465 Neural Basis of Perception 3 hours.
Psychophysical and physiological studies of sensory systems and processes. Primary emphasis on the early processing of visual stimuli. **Prerequisite(s):** Graduate standing; or PSCH 351 and consent of the instructor.

466 Neural Basis of Motivation 3 hours.
Review of empirical data and theories concerning the physiological basis of motivational processes in animals and humans.

Prerequisite(s): Graduate standing; or PSCH 262 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. **Prerequisite(s):** PSCH 262 or graduate standing.

481 Interviewing 1 hour.
Lecture on the theory and practice of clinical interviewing with supervised experience. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Graduate standing in psychology or consent of the instructor.

484 Neuroscience I 3 hours.
Neuroscience as an integrative discipline. Neuroanatomy of vertebrates, neural development, cellular neurobiology, action potential mechanisms, synaptic transmission, and neuropharmacology. **Same as** BIOS 484 and PHIL 484. **Prerequisite(s):** BIOS 286 or PSCH 262.

485 Neuroscience II 3 hours.
Intergrative neuroscience, continuation of BIOS/PSCH/PHIL 484. Sensory and motor systems; learning, memory, and language. Pathology of nervous systems. Philosophical perspectives and modeling. **Same as** BIOS 485 and PHIL 485. **Prerequisite(s):** BIOS 484.

494 Special Topics in Psychology 1 TO 4 hours.
Advanced treatment of an announced topic. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Graduate standing or consent of the instructor.

495 Seminar in Psychology 1 TO 3 hours.
Seminar devoted to special topics in psychology. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 9 hours. Students may register in more than one section per term. **Prerequisite(s):** Graduate standing or consent of the instructor.

504 Rating Scale and Questionnaire Design and Analysis 4 hours.
Development and administration of rating scales and questionnaires, analysis of data, and reporting of



results. The focus is on rating scales. **Same as** EPSY 504.
Prerequisite(s): ED 501, and ED 503 or EPSY 503 or the equivalent or consent of the instructor.

**505
Advanced History of Psychology 3 hours.**
The history of scientific psychology, with an emphasis on the forerunners of major contemporary research problems. **Prerequisite(s):** Completion of master's thesis.

**506
Item Response Theory/Rasch Measurement 4 hours.**
Statistical inference with item response theory models, useful to measure an individual's performance on a test or questionnaire. Models include parametric, nonparametric, unidimensional, multidimensional, and cognitive. **Same as** EPSY 506. May be repeated to a maximum of 8 hours. Extensive computer use required. **Prerequisite(s):** ED 501 and EPSY 503 and EPSY 546 or the equivalent. Appropriate score on the department placement test. Graduate or professional standing required or consent of the instructor.

**507
Emerging Research Issues 1 hour.**
Weekly seminar that introduces PhD students in psychology to the current research of each faculty member in the department of psychology. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours. **Prerequisite(s):** Consent of the instructor.

**508
Colloquium on the Teaching of Psychology 1 hour.**
Required training to prepare graduate students for contact teaching in the Department of Psychology. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** 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(s):** 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(s):** Consent of the instructor.

**515
Psychology of Women and Gender 3 hours.**
Critical examination of psychological theories and research on women and gender, including biological, psychoanalytic, socialization, power, and social constructionist perspectives. **Same as** GWS 515.

Prerequisite(s): Graduate standing in psychology; or PSCH 315 or GWS 315, and consent of the instructor.

**516
Research Methods in Social Psychology 3 hours.**
Critical analysis of current theories in social psychology. **Prerequisite(s):** PSCH 512 and PSCH 513 and PSCH 514; or consent of the instructor.

**517
Social Psychology of Education 4 hours.**
Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. **Same as** EPSY 502. **Prerequisite(s):** Admission to the PhD in Education program or the PhD in Psychology program; or consent of the instructor.

**518
Seminar in Social and Personality Psychology 1 TO 4 hours.**
Critical discussion of selected topics, such as helping and altruism, social judgment, group processes, attitude formation and change. Content varies. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

**519
Current Topics in Social Psychology 1 hour.**
Discussion of recently published research and ongoing research by department faculty and graduate students. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

**520
Development in Infancy and Early Childhood 4 hours.**
Consideration of development in the preschool years. Stress on theory, research, individual child study, and educational implications. **Same as** EPSY 526. **Prerequisite(s):** ED 422 or PSCH 422 or the equivalent.

**525
Achievement Motivation 4 hours.**
The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. **Same as** EPSY 530.

Prerequisite(s): 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(s): Consent of the instructor.

**527
Seminar in Moral Development, Character Formation, and Education 4 hours.**
Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. **Same as** EPSY 527. **Prerequisite(s):** ED 422 or PSCH 422 or the equivalent, or admission to the PhD in Education program, PhD in Psychology program, or PhD in Social Work program, or consent of the instructor.

**531
Community Research 3 hours.**
Introduction to research design for community and action research; data collection techniques; perspectives on the relationship between researchers and communities; ethical issues; and philosophies of science informing community-based research.

**532
Community Intervention 3 hours.**
Theory research, and practice of community interventions in public, nonprofit, and voluntary settings, such as disability organizations; intervention types and effectiveness; role of community intervener. **Same as** DHD 532. **Prerequisite(s):** Consent of the instructor.

**533
Advanced Community and Prevention Research 3 hours.**
Overview of community psychology theory and intervention research in areas like prevention, empowerment, diversity, ecology, competence enhancement, and social change from historical and contemporary perspectives.

Prerequisite(s): Graduate standing in psychology or consent of the instructor.

**534
Prevention Research, Theory, and Practice 3 hours.**
Emphasizes issues related to the conceptualization, design, implementation, and evaluation of prevention and competence-promotion programming. **Prerequisite(s):** Consent of the instructor.

**537
Seminar in Action Research 3 hours.**
Supervised action research in community settings, including entry, data collection, ethics, feedback, and report preparation. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Graduate standing in the Community and Prevention Research Specialization of the PhD in Psychology program or consent of the instructor.

**538
Seminar in Community and Prevention Research 1 TO 4 hours.**
Examination of a selected topic in community and prevention research. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** PSCH 530 or consent of the instructor.

**539
Current Topics in Community and Prevention Research 1 hour.**
Ongoing seminar with faculty and graduate students to discuss contemporary issues in community and prevention research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

**540
Research with Diverse Groups 3 hours.**
Highlights some of the issues relevant to doing research with diverse groups, such as race/ethnicity, gender, social class, age, disability.

**541
Introduction to Computing in Psychology 1 hour.**
An introduction to applications of computing in psychological research. Several projects are required. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Consent of the instructor.



543 Research Design and Analysis 4 hours. Experimental design, advanced analysis of variance (ANOVA), and statistical analyses for experimental and quasi-experimental designs, interpretation and writing results in APA style, SPSS. **Prerequisite(s):** Graduate standing in psychology or consent of the instructor.

544 Latent Variable Models 3 hours. Statistical methods and practical issues relevant to latent variable models with special emphasis on factor analysis and structural equation modeling. **Prerequisite(s):** PSCH 545.

545 Multivariate Analysis 3 hours. The statistical analysis of functional relationships among two or more variables; multivariate regression, canonical correlation, discriminant analysis, multivariate analysis of variance, principal components, factor analysis, logistic regression, cluster analysis. **Prerequisite(s):** PSCH 543 and graduate standing in psychology; or consent of the instructor.

546 Theory and Practice in Program Evaluation 3 hours. Introduction to theory, design, and practice of program evaluation. Emphasis will be on theories of social programming, selecting appropriate methods, and politics of evaluation. **Prerequisite(s):** PSCH 531 or the equivalent and PSCH 543 and PSCH 545; or consent of the instructor.

548 Seminar in Methods and Measurement 1 TO 4 hours. Seminar on a preannounced topic in methodology, measurement, or mathematical psychology. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

549 Current Topics in Psychology and Law 1 hour. Discussion of recently published research and ongoing research in psychology and law by department faculty, graduate students and outside speakers. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

550 Proseminar in Educational Psychology 2 hours. Interdisciplinary colloquia on selected topics in educational psychology. Serves as introduction to faculty research foci. **Same as** EPSY 500. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Admission to the PhD in Education program or the PhD in Psychology program, or consent of the instructor.

551 Cognition and Instruction 4 hours. Current research on relations among cognitive processes, learning, and instruction. **Same as** EPSY 501. **Prerequisite(s):** Admission to the PhD in Education program or the PhD in Psychology program, or consent of the instructor.

552 Cognition and Instruction: Advanced Constructivist Approaches 4 hours. 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. **Same as** EPSY 529. **Prerequisite(s):** EPSY 429 or PSCH 429 or the equivalent, and admission into a PhD program in the College of Education or psychology or consent of instructor.

558 Seminar in Cognitive Psychology 1 TO 4 hours. Detailed critical review of selected topics in cognitive psychology: emphasis on current research and theoretical developments. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

559 Current Topics in Cognitive Psychology 1 hour. Discussion of current research and theoretical issues in broad areas of cognitive psychology. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** 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(s):** Consent of the instructor.

568 Seminar in Biopsychology 1 TO 4 hours. Current research issues and studies in biopsychology are discussed in terms of methodology and theory. Topic to be announced each semester. May be repeated. **Prerequisite(s):** Consent of the instructor.

569 Current Topics in Biopsychology 1 hour. Presentation of current research projects by staff and students. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** 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(s):** Consent of the instructor.

571 Psychopathology 3 hours. Detailed consideration of disorders of behavior, including description, etiology, prognosis, and experimental and clinical research; consideration of development and functions of classification systems of abnormal behavior and their relation to clinical decision making. **Prerequisite(s):** PSCH 570 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. **Prerequisite(s):** PSCH 572 and consent of the instructor.

574 Techniques of Psychological Intervention 3 hours. 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. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** PSCH 571 and consent of the instructor.

577 Ethics and Professional Development 3 hours. 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(s):** Graduate standing in psychology or consent of the instructor.

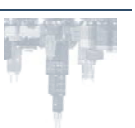
578 Seminar in Clinical Psychology 1 TO 4 hours. In-depth coverage of selected current topics in clinical psychology. Emphasis is on current research. **Prerequisite(s):** Consent of the instructor.

579 Current Topics in Clinical Psychology 1 hour. Research and case presentations in clinical psychology. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

581 Practicum in Interviewing 1 hour. Interviewing practicum through the Office of Applied Psychological Services. Students observe and conduct clinical interviews under supervision. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** PSCH 481 and consent of the instructor.

582 Practicum in Psychological Assessment 4 hours. Supervised practice in psychodiagnostic testing in various facilities associated with the graduate training program in clinical psychology. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** PSCH 573 and consent of the instructor.

583 Practicum in Clinical Intervention 4 hours. Instruction and supervision in the practice of psychological intervention, application of basic psycho-





logical principles to varied parent populations. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** PSCH 574 and consent of the instructor.

584
Practicum for Clinical Trainees on Assessment, Intervention, and Research 0 TO 3 hours.
Presentation and discussion of trainee assessment, intervention, and research projects. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Acceptance into either an NIMH- or OAPS-sponsored training program.

587
Practicum in Instruction in Psychology 0 TO 9 hours.
Seminar on course planning and supervised teaching of an undergraduate course. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. Students register for 2 to 9 hours. **Prerequisite(s):** Consent of the instructor.

591
Research Apprenticeship 2 TO 3 hours.
Directed training in conducting research in specific areas of psychology, and in developing skills related to the research. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 5 hours. **Prerequisite(s):** Consent of the instructor.

594
Advanced Special Topics in Psychology 1 TO 4 hours.
Advanced treatment of an announced topic. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

595
Methods and Measurement in Clinical Psychology 2 hours.
Provides students with an overview of research methods, process concerns, ethics, and issues that are relevant to the field of clinical psychology. May be repeated. **Prerequisite(s):** Consent of the instructor.

596
Independent Study 1 TO 12 hours.
Research on or study of topics not included in regular classes or the-

sis and dissertation research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

598
Thesis Research 0 TO 16 hours.
Research on the topic of the master's thesis. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 12 hours. **Prerequisite(s):** Consent of the instructor.

599
Dissertation Research 0 TO 16 hours.
Research on the topic of the doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Public Administration (PA)

400
Public Administration Theory 3 OR 4 hours.
Public administration as a professional and scholarly area of knowledge and practice focusing on administrative reform and its intellectual roots. Politics versus administration, efficiency, effectiveness, representative bureaucracy, and market versus bureaucratic alternatives. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

407
Data Analysis for Public Administration 4 hours.
Topics and methods of analyzing information relevant to the administration and management of public programs and organizations. Includes causation, univariate statistics, significance testing, correlation, and regression. **Prerequisite(s):** Appropriate score on the department placement test; and graduate standing; or consent of the instructor. Admission to the MPA program or consent of the instructor.

410
Economics for Public Administration and Policy Decisions 3 OR 4 hours.
Basic economic tools and methods relevant to public administration and current policy, including opportunity cost, competition versus monopoly, economic efficiency, equity, market failure, public goods, and externalities. 3

undergraduate hours. 4 graduate hours. **Prerequisite(s):** Appropriate score on the department placement test and graduate standing and admission to the MPA program; or consent of the instructor.

415
Organization Theory and Public Management 3 OR 4 hours.
Theories and concepts of organizational behavior and public management from economics, sociology, and political science. Organizational decision making, bureaucracy, organizational change and learning, public versus private organizations, leadership, and organizational culture. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

447
Survey Planning and Design 3 hours.
Theory and applications of sample survey planning and design for conducting research in health sciences and related fields. Addresses three major topics: survey design and planning, sampling, and data collection procedures. **Same as** CHSC 447. **Prerequisite(s):** Graduate or professional standing and BSTT 400 or the equivalent. **Recommended background:** Credit in CHSC 446 or the equivalent.

460
Computers in Public Administration 4 hours.
Database theory and constructing and managing databases relevant to the operation of government. Utilizes database software and allows students to gain practice with complex database programs and development of a database system. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

461
Management of Information Technology in Government 4 hours.
Concepts and methods of planning, implementing, and managing new information technology or modifying existing technology. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

463
Online Public Administration 4 hours.
Application of the Internet for public management. Web-based service delivery, online governance, the technological divide, and the changing role of public managers.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

464
Technology and Innovation Theory 4 hours.
The course focuses on theories surrounding the creation, development, transfer, and use of technology. **Prerequisite(s):** Admission to the PhD in Public Administration program or consent of the instructor.

466
Science, Technology, and Public Policy 4 hours.
This course addresses the relationships between public policy and science and technology in the United States. **Prerequisite(s):** Admission to the PhD in Public Administration program or consent of the instructor.

490
Field Experience in Public Administration 4 hours.
Students work in an organization, such as a government agency, community group, or nonprofit organization. Students are required to submit written work and meet with professor on periodic basis to review work experience. May be repeated. A maximum of 4 hours of credit may be applied to the Master of Public Administration program. Fieldwork required. Students who have no prior work experience in the public or nonprofit sectors are strongly recommended to register for this course. **Prerequisite(s):** Graduate standing required; and admission to the MPA program or consent of the instructor.

494
Special Topics in Public Administration 3 OR 4 hours.
Consideration of timely or enduring issues in public administration not available in regularly offered courses. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

502
The Legal Context of Public Administration 4 hours.
Legal basis and statutory framework for administrative agencies and actions in government. Relationship between courts and public agencies, rulemaking and adjudicative powers of public

agencies, and impact of specific laws on government.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

503

Public Personnel Management 4 hours.

History and current innovations in managing personnel and other areas of human resources. Compensation, classification, affirmative action, performance appraisal, labor relations, and unions. Statutory and court decisions affecting government personnel issues. **Prerequisite(s):** Admission to the MPA program or consent of the instructor.

504

Budgeting for Public Administration 4 hours.

Processes and methods relevant to government finances and fiscal health: revenues, taxation, budget formulation, operating budgets, cost analysis, planning and performance, budget reforms, politics, capital budgeting, role of budgeting in management.

Prerequisite(s): Admission to the MPA Program or consent of the instructor.

506

Policy Development and Analysis for Public Administrators 4 hours.

Examines the process by which public policies are formulated, decided on, implemented, and evaluated. Techniques of analysis appropriate for various policy issues, and substantive policy issues facing us today.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

510

Organization Theory and Behavior in Public Administration Research 4 hours.

Analysis of major analytical models of organizations; decision making; control and accountability; change and development; interorganizational relations; the organization-environment interface. **Prerequisite(s):** Admission to the PhD in Public Administration program or approval of the program director.

511

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 fac-

tors shaping the present state of the discipline. **Prerequisite(s):** Admission to the PhD in Public Administration program or approval of the program 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(s): Admission to the PhD in Public Administration program or approval of the program director.

521

Strategic Management: Planning and Measurement 4 hours.

This course addresses strategies and issues relating to the strategic management of public and quasi-public organizations. It addresses strategic planning and performance measurement processes within organizations.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

522

Ethics and Accountability 4 hours.

Better government through institutionalizing ethics and accountability. Effectiveness of boards of ethics, inspectors general, codes of ethics, and educational programs. History of ethics within the Western intellectual tradition.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

523

Intergovernmental Management 4 hours.

Relationships between federal, state, and local governments, focusing on management of overlapping programmatic, regulatory, and fiscal responsibilities.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

524

Leadership in Public Sector Organizations 4 hours.

Examines theories and practices of leadership in public sector organizations. Global, political, social, and organizational contexts of public sector leaders and interface between administrators, appointees, elected officials.

Prerequisite(s): Admission to the MPA program or consent of the instructor.

526

Public Decision Analysis 4 hours.

Provides an introductory treatment of decision analysis. The intended participants are students who want to learn more about decision making under uncertainty and tools that can be used to support it. **Prerequisite(s):** PA 407 or consent of the instructor.

527

Public Management Theory 4 hours.

Addresses the development of the public management subfield within the field of public administration. It covers the development of public management theory from its early stages to current questions and theoretical approaches. **Prerequisite(s):** Admission to the PhD in Public Administration program or consent of the instructor.

528

Public Program Evaluation 4 hours.

Theory and procedures for evaluating the effectiveness of programs administered by public and nonprofit organizations. Includes application of research design, quantitative, and qualitative methodologies. **Prerequisite(s):** PA 542 or equivalent; and admission to the PhD in Public Administration program or consent of the instructor.

529

Change and Reform in Public Organizations 4 hours.

Examines how large, bureaucratic organizations change how they do business. Can improved efficiency and effectiveness result from such change? What techniques are being applied by public organizations to achieve such change?

Prerequisite(s): Admission to the MPA program or consent of the instructor.

532

Labor Management Relations in the Public Sector 4 hours.

Skills and knowledge to manage labor relations in government. Constitutional influences on public employment, rights of public employees, management and labor unions; civil service laws, collective bargaining, nondiscrimination, and equal opportunity.

Prerequisite(s): PA 503; and admission to the MPA program or consent of the instructor.

533

Managing Workplace Diversity 4 hours.

Examines discrimination and diversity in public sector workplaces along several dimensions, including race, ethnicity, sex, age, sexual orientation, and physical ability.

Prerequisite(s): PA 503; and admission to the MPA program or consent of the instructor.

534

Human Resource Development and Management in Public Administration 4 hours.

Topics in public personnel administration; work motivation, performance appraisal, high performance work systems, equal employment opportunity, affirmative action, strategic human resource management, and representative bureaucracy.

Prerequisite(s): Admission to a PhD program or consent of the instructor.

540

Research Design for Public Administration 4 hours.

Logic and methods of quantitative and nonquantitative research in public administration. Issues in measurement; causal inference; experimental and quasi-experimental designs; and methods of data collection. **Prerequisite(s):** Admission to the PhD in Public Administration program 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(s): Graduate standing; and PA 540 or equivalent or approval of the instructor.

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(s):** Graduate standing; and PA 541 or equivalent or approval of the instructor.





544
Qualitative Research
Methods in Public
Administration 4 hours.

The uses, strengths, and limitations of qualitative methods of research and analysis, including case studies, participant-observer, and ethnography, will be explored. **Prerequisite(s):** Graduate or professional standing; PA 540 or equivalent; or consent of the instructor.

545
Research Topics in
Public
Administration I 2 hours.
 Provides PhD students with a better understanding of current research topics in Public Administration. Students will read current working papers and published articles so as to develop the tools needed for critical analysis of current research. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Admission to the PhD program in Public Administration and advanced standing or consent of the instructor.

546
Research Topics
in Public
Administration II 2 hours.
 Continuation of PA 545. Students critically analyze current research and will develop a research topic of their own, focusing on the elements needed to write a quality research paper. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** PA 545; and admission to the PhD program in Public Administration with advanced standing or consent of the instructor.

550
Financial Management
of Government 4 hours.
 Overview of issues and concepts important for administration and management of government's financial affairs: government accounting, purchasing, cash management and investment, risk management, pension and benefits administration, debt management and capital financing. **Prerequisite(s):** PA 504; and admission to the MPA program or consent of the instructor.

551
Governmental
Accounting 4 hours.
 Introduction to major concepts, principles, and objectives of governmental accounting (including fund accounting) and budgetary control systems for local and state government. Designed for students with little or no background in accounting. **Prerequisite(s):** PA 504; and

admission to the MPA program or consent of the instructor.

552
Public Capital
Budgeting and
Finance 4 hours.

Examines governmental capital budgeting processes, linkages between the capital budget and capital improvement plan, and methods and techniques of financing capital projects including debt financing. **Prerequisite(s):** PA 504; and admission to the MPA program or consent of the instructor.

553
State and Local
Public Finance 4 hours.
 Analyzes expenditures and revenues of state and local governments and public sector responses to market failures. Examines state and local revenue sources and discusses governmental provision of services. **Prerequisite(s):** PA 504; and admission in the MPA program or consent of the instructor.

554
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(s):** Graduate or professional standing; and PA 410 and PA 504 or equivalents; or consent of the instructor.

567
Topics in Political
Communication 4 hours.
 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. **Same as** COMM 567 and POLS 567. **Prerequisite(s):** Consent of the instructor.

577
Survey Questionnaire
Design 3 hours.
 Concepts and strategies for developing survey questionnaires for various modes of survey data collection. Students develop and present questionnaires related to their individual interests. **Same as** CHSC 577. **Prerequisite(s):** CHSC 446 or CHSC 447; or consent of the instructor.

578
Surveys, Public Opinion,
and Public Policy 4 hours.
 Addresses the nature of the relationship between public policy and

public opinion and the role that surveys play in that relationship. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

579
Practicum in Survey
Methodology 2 TO 6 hours.
 Students learn about survey research by participating in the process of conducting a survey or surveys. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

580
Survey
Nonresponse 2 hours.
 Provides an overview of current problems in survey nonresponse and related questions of impact on data quality. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

581
Cross-Cultural
Survey Research
Methods 2 hours.
 Provides graduate students with a clear understanding of the methodological issues involved in collecting survey data across multiple cultural groups and best practices when conducting cross-cultural research. **Recommended background:** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

582
Survey Data Collection
Methods 2 hours.
 This course will address the impact of data collection methods on survey responses and data quality. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

583
The Psychology of
Survey Measurement:
Cognitive and Social
Processes 2 hours.
 Introduces students to one approach to survey methodology: the examination of the psychological processes through which survey respondents answer questions. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

584
Internet Surveys 2 hours.
 Examines current developments in the collection of survey data via the internet, including both the methodological strengths and

weaknesses of this approach, as well as current standards for best practice. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

585
Survey Research
Ethics 2 hours.
 Students will be exposed to survey research ethical issues. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

586
The History of Survey
Methodology 2 hours.
 Examines the history of surveys, their development, and change over time. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

587
Seminar on Special
Topics in Survey
Methodology 2 hours.
 This seminar is for special topics in survey methodology not covered in the other elective courses. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

588
Survey Data
Reduction and
Analysis 2 hours.
 Provides an in-depth overview of available procedures and standards for survey data reduction and data analysis activities. **Prerequisite(s):** Admission to the MPA or PhD in Public Administration program or consent of the instructor.

590
Public Administration
Capstone 4 hours.
 Integration of classroom learning with practical experience. Students will work in groups to solve real problems for public and nonprofit organizations. Extensive collaboration required among group members outside of class time. Students should expect significant fieldwork at their assigned organizations. Students are responsible to the course professor and to the project supervisor in their assigned organizations. Because the course work is team-based, students are not allowed to drop this course once teams are created. **Prerequisite(s):** Consent of the instructor and enrollment in the MPA program. Course must be taken in the last two semesters in the MPA program or consent of the instructor.



593

Independent Research in Public Administration 1 TO 8 hours.

Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the director of graduate studies and consent of the instructor.

594

Special Topics in Public Administration 1 TO 4 hours.

Advanced study of an announced topic. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Admission to the PhD in Public Administration program or consent of the instructor.

596

Independent Study in Public Administration 1 TO 4 hours.

Advanced study and analysis of a topic under guidance of select faculty. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the director of graduate studies and consent of the instructor.

599

PhD Thesis Research 0 TO 16 hours.

Individual study and research. Satisfactory/Unsatisfactory grading only. May be repeated.

Prerequisite(s): Open only to degree candidates, upon approval of topic 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(s):** Consent of the instructor.

500

Health Maintenance and Promotion in Primary Care Nursing 4 hours.

Prepares nurse practitioners to provide health maintenance and promotion to families and individuals in primary care settings.

Prerequisite(s): Credit or concurrent registration in NUSC 532 or consent of instructor.

502

School Nursing Theory and Trends 3 hours.

Explores population-focused frameworks, health needs, and legal mandates that impact school community. School nursing practice models are studied as relevant to developing leadership and management.

Prerequisite(s): Consent of the instructor.

505

Nursing Systems Operations Management 3 hours.

Nursing systems operations management of health services.

Examines the managerial role at individual, program, work unit, department, and organizational levels. Includes focus on interaction of the organization and environment.

Same as NUAS 505. **Prerequisite(s):** Consent of the instructor.

507

Advanced Community Health Nursing: Introduction and Interventions 4 hours.

Addresses application of evidence-based population-focused interventions in healthcare organizations that promote wellness and improve community health status. Introduces leadership roles/concepts in advanced public health nursing practice.

509

Population-Focused Assessment 3 hours.

Explores population-focused assessment in community and integrated healthcare systems emphasizing the application of assessment models used in health service delivery and market analysis. **Prerequisite(s):** Credit or concurrent registration in EPID 400 and credit or concurrent registration in NUSC 525 and credit or concurrent registration in NUSC 526.

511

Planning and Evaluation for Advanced Nursing Practice 3 hours.

Explores strategic and program planning applications. Focuses on evaluation as a measurement of quality, performance, and impact of health services. Emphasizes interdisciplinary perspective and addresses integrated quality improvement systems.

Prerequisite(s): NUPH 509 and NUSC 525 and NUSC 526. Requires concurrent registration in NUSC 527.

512

Healthcare Human Resources Management 3 hours.

Focuses on the development of a strategic human resource plan to support the mission of the healthcare organization. Current human resources management and organizational performance research findings are explored. **Same as** NUAS 512. **Prerequisite(s):** NUAS 505 or NUPH 505.

517

Budget and Finance of Health and Nursing Services 3 hours.

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. **Same as** NUAS 517.

Prerequisite(s): NUAS 505 or NUPH 505.

518

Field Study in Health and Nursing Management 3 hours.

Field study emphasizing leadership within population-focused nursing management practice, including organization and management concepts from public and private perspective. **Same as** NUAS 518.

Prerequisite(s): NUAS 516 or NUPH 516; and NUAS 517 or NUPH 517; or consent of the instructor.

519

School Nursing Internship 1 TO 3 hours.

Concepts and principles and best practices of school nursing applied within the school community. Clinical experience with an emphasis on development of a coordinated school health program. May be repeated.

Prerequisite(s): Credit or concurrent registration in NUPH 502.

520

Internship in Advanced Nursing 1 TO 3 hours.

Intensive field study for advanced nursing practice with emphasis on integration of graduate course work. **Same as** NUAS 520. May be repeated. **Prerequisite(s):** Consent of the instructor.

524

Primary Care Nursing of Acute and Chronic Disorders I 4 hours.

Prepares nurse practitioners to assess, diagnose, and manage stable chronic and acute episodic illnesses encountered in primary care settings. **Prerequisite(s):** NUPH 500.

525

Primary Care Nursing of Acute and Chronic Disorders II 6 hours.

Second of a two-course sequence to prepare nurse practitioners to assess, diagnose, and manage stable chronic and chronic episodic illnesses encountered in primary care settings. **Prerequisite(s):** NUPH 524.

528

Advanced Clinical Practice in Primary Care Nursing 1 TO 5 hours.

Healthcare issues, advanced clinical skills, and supervised practicum experiences specific to students' selected practice area or population groups in rural, urban, or international settings. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): NUPH 525.

529

Practicum in Occupational Health Nursing 1 TO 5 hours.

Practicum emphasizing interdisciplinary experience in the identification of work-related health problems, their treatment, and follow-up. Learning activities are individualized to meet the student's learning needs. **Prerequisite(s):** NUPH 400 and credit or concurrent registration in EOHS 421 and credit or concurrent registration in EOHS 482 and credit or concurrent registration in EOHS 551.

Public Policy Analysis (PPA)

401

Data Analysis I 3 OR 4 hours. Statistical inference for the social sciences. Emphasis on univariate and bivariate statistics. **Same as** POLS 401. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): POLS 200 and POLS 201; or graduate standing.

500

Introduction to Policy and Governance 4 hours.

Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored. **Same as** POLS 500. Consent of the department required for nondegree graduate students.

501

Data Analysis II 4 hours. Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. **Same as** POLS



501. **Prerequisite(s):** POLS 401 or PPA 401.

**541
Policy Formation,
Implementation, and
Evaluation 4 hours.**

Introduction to political science theories of how elections, interest groups, and state structure affect the formulation of public solutions to societal problems. **Same as** POLS 541. **Prerequisite(s):** Consent of the department required for nondegree graduate students.

**574
The Impact of College
on Students 4 hours.**

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. **Same as** PS 574. **Prerequisite(s):** Consent of the instructor.

**575
Higher Education
Organization and
Administration 4 hours.**

Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. **Same as** PS 575. **Prerequisite(s):** Admission to PhD in Public Policy Analysis program or consent of the instructor.

**576
History of
Higher Education 4 hours.**

Key historical events which have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. **Same as** PS 576. **Prerequisite(s):** Admission to PhD in Public Policy Analysis program or consent of the instructor.

**577
American Academic
Profession 4 hours.**

Historical and systemic foundations of the academic profession. Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. **Same as** PS 577.

Prerequisite(s): Admission to the PhD in Public Policy Analysis program and consent of the instructor.

**584
Methods of
Policy Analysis 4 hours.**

Analytic, allocative, and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. **Same as** UPP

584. **Prerequisite(s):** Consent of the instructor.

**590
Advanced Public
Policy Workshop 4 hours.**

Interdisciplinary workshop on preparing a dissertation proposal for public policy analysis students.

Same as POLS 590.

Prerequisite(s): Advanced standing in the PhD in Public Policy Analysis program and completion of core PPA courses.

Religious Studies (RELS)

**446
Race, Ethnicity,
and Gender in
American
Religion 3 OR 4 hours.**

Religious institutions in the U.S. as a crucible for racial, ethnic, and gender identities, group formation, and intergroup relations; major world religions represented in the U.S. **Same as** SOC 446. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SOC 100 and junior standing or above; or consent of instructor.

**478
The Bible as
Literature 3 OR 4 hours.**

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. **Same as** ENGL 478 and JST 478. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in ENGL 240; and grade of C or better in ENGL 241 or grade of C or better in ENGL 242 or grade of C or better in ENGL 243; or consent of the instructor.

**495
Topics in
Religious
History 3 OR 4 hours.**

Specific topics are announced each term. **Same as** HIST 495. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of history or consent of the instructor.

Russian (RUSS)

**401
Russian
Composition and
Conversation III 3 OR 4 hours.**

Oral presentations, compositions, conversation: daily life and current events. Problems of grammar and syntax. Improving pronunciation and intonation. Reading. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): RUSS 302 or the equivalent.

**402
Russian
Composition and
Conversation IV 3 OR 4 hours.**

Continuation of RUSS 401. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): RUSS 401 or the equivalent.

**410
Structure of Modern
Russian 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** At least 4 semester hours of Russian or the equivalent.

**450
Studies in the
Russian Novel 3 OR 4 hours.**

Study of a major novelist, movement, or special themes. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** 24 hours of Russian or consent of the instructor.

**460
Studies in
Russian
Literature 3 OR 4 hours.**

Study of a major author, movement, genre, or special topic. Content varies. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** 24 hours of Russian or consent of the instructor.

**499
Independent
Study 1 TO 4 hours.**

Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Graduate students may register for more than one section per term.

Prerequisite(s): Senior or graduate standing, 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(s):** RUSS 410 or SLAV 505 or the equivalent.

**515
Topics in
Contemporary
Russian Linguistics 4 hours.**

Variable content. May be repeated to a maximum of 12 hours.

Prerequisite(s): RUSS 410 or the equivalent.

**520
Topics in Historical
Russian Linguistics 4 hours.**

Specific topics are announced each term. May be repeated to a maximum of 12 hours.

**550
Studies in
Russian
Romanticism 4 hours.**

Study of a topic, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

**555
Studies in
Russian Realism 4 hours.**

Study of a topic, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

**560
Studies in Russian
Neo-Realism and
Modernism 4 hours.**

Study of a topic, author, or movement. Content varies. May be repeated to a maximum of 12 hours.

**565
Studies in
Soviet Prose 4 hours.**

Study of a topic or movement. Content varies. May be repeated to a maximum of 12 hours.

**570
Studies in Russian
Literary Criticism 4 hours.**

Study of a critical school or movement. Content varies. May be repeated to a maximum of 12 hours.

**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.**

Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor and the head of the department.

Slavic and Baltic Languages and Literatures (SLAV)

405

Problems in Slavic Grammars 3 OR 4 hours.

Systematic review of important topics in grammar and syntax. Content varies. Required for department undergraduate majors in Slavic programs. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** RUSS 302 or POL 302 or SLAV 302 or the equivalent.

410

Structure of Modern Serbian 3 OR 4 hours.

A synchronic linguistic analysis of Serbian phonology and morphology with fundamentals of syntax. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SLAV 104 or the equivalent or consent of the instructor.

433

Topics in Eastern European History 3 OR 4 hours.

Specific topics are announced each term. **Same as** HIST 433. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** 3 hours of European history or consent of the instructor.

460

Studies in East European Literatures and Culture 3 OR 4 hours.

Study of a topic, author, genre, or movement. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** 24 hours of Slavic or Baltic or consent of the instructor.

470

Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

471

Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching,

including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in SLAV 470, and approval of the department.

499

Independent Study 1 TO 4 hours.

Investigation of special problems under the general direction of a staff member. May be repeated to a maximum of 8 hours. Graduate students may register for more than one section per term. **Prerequisite(s):** Senior or graduate standing, 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(s):** 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(s):** SLAV 104 or the equivalent, or consent of the instructor.

515

Topics in Contemporary Serbian Linguistics 4 hours.

Variable content. May be repeated to a maximum of 12 hours. **Prerequisite(s):** SLAV 410.

520

Topics in Historical Serbian Linguistics 4 hours.

Variable content. May be repeated to a maximum of 12 hours. **Prerequisite(s):** SLAV 505 or consent of the instructor.

525

Topics in Serbian Syntax 4 hours.

Variable content. May be repeated to a maximum of 12 hours.

530

Topics in Ukrainian Linguistics 4 hours.

Variable content. May be repeated to a maximum of 12 hours.

535

Topics in Comparative Slavic Linguistics 4 hours.

Comparative study of various linguistic aspects of the Slavic languages. May be repeated to a maximum of 12 hours.

536

Topics in Comparative Slavic Literatures 4 hours.

Comparative study of a literary topic or movement. Content varies. May be repeated to a maximum of 12 hours.

542

Studies in Serbian Poetry 4 hours.

Specific topics are announced each semester. May be repeated to a maximum of 12 hours.

545

Studies in Serbian Prose I 4 hours.

Specific topics of the Serbian short story and novel are announced each term. May be repeated to a maximum of 12 hours.

546

Topics in Serbian Prose II 4 hours.

Specific topics of Serbian drama are announced each semester. May be repeated to a maximum of 12 hours.

550

Studies in Yugoslav Literary Historiography and Criticism 4 hours.

Major concepts and movements in the South Slavic literary history. May be repeated to a maximum of 12 hours.

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.

Study of a period or movement in the nineteenth and early twentieth-century Ukrainian poetry. Content varies. May be repeated to a maximum of 12 hours.

563

Studies in Twentieth-Century Ukrainian Poetry 4 hours.

Study of a period or movement. Content varies. May be repeated to a maximum of 12 hours.

565

Studies in Nineteenth-Century Ukrainian Prose 4 hours.

Study of a genre, topic, period, movement, or author. Content varies. May be repeated to a maximum of 12 hours.

566

Studies in Twentieth-Century Ukrainian Prose 4 hours.

Study of a genre, topic, period, movement, or author. Content varies. May be repeated to a maximum of 12 hours.

568

Studies in Ukrainian Drama 4 hours.

Study of a period, movement, or author. Content varies. May be repeated to a maximum of 12 hours.

570

Studies in Ukrainian Literary Historiography and Criticism 4 hours.

Study of methodology, periods, schools and groups, individual literary historians and critics. Content varies. May be repeated to a maximum of 12 hours.

575

Studies in Slavic Literary Theory 4 hours.

Russian, Czech, Polish, and Serbian contributions to literary theory: formalism, structuralism, semiotics, phenomenology. May be repeated to a maximum of 12 hours. Taught in English.

576

Methods and Principles of Translation 4 hours.

Introduction to theory and methods of literary translation. Extensive practice translating expository prose, literary prose, and poetry from Slavic languages into English. Taught in English.

596

Independent Study 1 TO 4 hours.

Investigation of special problems under the general direction of a faculty member. May be repeated up to 8 times. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor and the head of the department.

599

PhD Thesis Research 0 TO 16 hours.

Independent research on a topic approved for a graduate thesis. Students engaged in research and writing theses will be assigned to this course at the discretion of the department. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the department. Open only to PhD degree students.



Social Work (SOCW)

410

Human Behavior and the Social Environment 3 hours. Human development through the life cycle including urban family, group, community, and organizational interactions with social, cultural, psychological factors. Credit is not given for SOCW 410 if the student has credit for SOCW 535.

Prerequisite(s): Graduate standing and consent of the instructor or admission to the MSW program.

411

Social Work in a Multicultural Society 3 hours. Place of social work in a multicultural society; focus on racial and ethnic minority groups, particularly African-Americans, Latinos, Asian Americans, and Native Americans. Credit is not given for SOCW 411 if the student has credit for SOCW 537. **Prerequisite(s):** Admission to MSW program.

420

Policy I: Social Welfare Policy and Services 3 hours. Social work history; structure and development of current policies; policy analysis and policy advocacy skills for social and economic justice. Credit is not given for SOCW 420 if the student has credit for SOCW 550. **Prerequisite(s):** Admission to MSW program.

430

Practice I: Generalist Practice with Individuals, Families, and Groups 3 hours. Generalist practice principles applied to individuals, families, and groups, including content on community context, racial and ethnic minorities, poor, oppressed, and other urban vulnerable communities. Credit is not given for SOCW 430 if the student has credit for SOCW 501. **Prerequisite(s):** Admission to the MSW program.

431

Practice II: Generalist Practice with Task Groups, Organizations, and Communities 3 hours. Generalist practice principles applied to task groups, organizations, and communities, including focus on community context and the poor, oppressed, and other urban vulnerable communities. Credit is not given for SOCW 431 if the student has credit for SOCW 502. **Prerequisite(s):** SOCW 430 and graduate standing.

460

Research I: Social Work Research 3 hours. Research methodology basics applied to social work: problem formulation, design, measurement, sampling, data analysis, computerization, ethics, qualitative and quantitative methodologies. Credit is not given for SOCW 460 if the student has credit for SOCW 560.

Prerequisite(s): Admission to the MSW program.

480

Special Studies in School Social Work Practice 3 hours. Ecological and strengths-based interventions in urban school systems. **Prerequisite(s):** Admission to the post-MSW Type 73 program and graduate standing.

503

Family Practice in Urban Communities 3 hours. Empowering at-risk urban families using strengths-based intervention; brief treatment models; attention to diversity, community, poor, and other urban at-risk populations. **Prerequisite(s):** SOCW 430.

504

Group Theory and Practice 3 hours. Theory and practice of social work with empower groups in both clinical and large system settings; diversity and equity issues. **Prerequisite(s):** SOCW 430.

511

Practice with Children 3 hours. Direct treatment with urban at-risk children, including situations involving homelessness, substance abuse, violence; treatment modalities, emphasizing family, community, culture. **Prerequisite(s):** SOCW 430.

517

Practice with Family Violence, Neglect, and Abuse 3 hours. Ecological approach to family violence: physical, psychological, and sexual abuse of children, women, and elders at practice and policy levels; urban vulnerable population. **Prerequisite(s):** SOCW 430; or consent of the instructor.

519

Practice III: Community Health and Urban Development 3 hours. Advanced integrated practice with urban communities at levels of individuals, families, groups, organizations, and communities. Emphasis on diversity, strengths, capacity-building, and small systems. **Prerequisite(s):** Grade of C or better in SOCW 431.

520

Practice IV: Community Health and Urban Development 3 hours. Advanced, integrated practice with urban communities with emphasis on diversity, strengths, capacity-building, and large systems. **Prerequisite(s):** Grade of C or better in SOCW 519.

521

Aging Populations: Social Work Response 3 hours. Psychological, social, biological aging factors of individuals and families; emphasis on practice skills for community, long-term care and hospital-based services with urban emphases. **Prerequisite(s):** SOCW 410; or consent of the instructor.

522

Crisis Intervention 3 hours. Nature of crises, including suicide and large-scale disaster; strengths-based interventions in urban settings: medical and mental health facilities, schools, community centers, and neighborhoods. **Prerequisite(s):** SOCW 430.

523

Drug and Alcohol Abuse and Social Work 3 hours. History and pharmacology of alcohol and other drugs; etiology of abuse and dependence; assessment and treatment models; practice in multidisciplinary settings; emphasis on urban systems. **Prerequisite(s):** SOCW 430.

525

Social Work with Women 3 hours. Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. **Same as** GWS 525. **Prerequisite(s):** SOCW 410; or consent of the instructor.

527

Topics in Social Services 3 hours. Critical review of selected areas of social work, social services, and social welfare. **Prerequisite(s):** Consent of the instructor and admission to MSW program.

530

Leadership and Professional Development 3 hours. Social work leadership and professional development, including writing for publication, communication skills, personal leadership plan development, theory and practice of leadership at individual agency and community levels. **Prerequisite(s):** SOCW 410.

531

Policy II: Community Health and Urban Development 3 hours. Advanced policy content for urban communities, including health disparities, discrimination, urban poverty, and social dislocation. Analytical and policy practice skills addressed. **Prerequisite(s):** Grade of C or better in SOCW 420.

532

Social Work in Corrections 3 hours. Policy and practice roles of social workers in correctional settings with emphasis on race, ethnicity, gender, sexual orientation, and poverty factors. **Prerequisite(s):** SOCW 410; or consent of the instructor.

533

Sexual Minority Communities 3 hours. Community and social justice framework applied to gay, lesbian, bisexual, and transgendered populations; historical development of sexual minority communities; overview of social work response. **Prerequisite(s):** Admission to the MSW program or consent of the instructor.

534

Independent Study in Practice 1 TO 3 hours. Independent study in practice area not covered by existing course offerings. May be repeated to a maximum of 6 hours. **Prerequisite(s):** Consent of the instructor and approval of the college.

539

Mental Health Issues with Children and Adolescents 3 hours. Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with children and adolescents. **Prerequisite(s):** SOCW 410 or consent of the instructor.

540

Mental Health Issues with Adults 3 hours. Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with adults. **Prerequisite(s):** SOCW 410 or consent of the instructor.

544

Community Violence 3 hours. Urban community violence; impact on individuals and society; policies and theories critically studied from race, class, and gender perspectives; social work implications. **Prerequisite(s):** SOCW 410 or consent of the instructor.



545
HIV/AIDS: Social Work Challenges 3 hours.
HIV prevention and intervention in urban settings; system and ecological understanding of impact of HIV on society and role of social work practice and policy.
Prerequisite(s): SOCW 410 or consent of the instructor.

549
Independent Study in Human Behavior and the Social Environment 1 TO 3 hours.
Independent study in human behavior and social environment areas not covered by existing course offerings. May be repeated to a maximum of 6 hours. **Prerequisite(s):** Consent of the instructor and approval of the college.

551
Policy II: School Social Work Policy 3 hours.
Critical analysis of federal, state, and local policies relevant to social work practice in urban school systems.
Prerequisite(s): SOCW 420.

552
Policy II: Child and Family Policy 3 hours.
Critical analysis of policies affecting welfare of families and children; focus on child welfare, juvenile justice, adult criminal justice, mental health, and special education systems. **Prerequisite(s):** SOCW 420.

553
Policy II: Healthcare Systems and Policies 3 hours.
Critical analysis of current healthcare programs and policies including policy change skills; content on urban poor and at-risk populations.
Prerequisite(s): SOCW 420.

554
Policy II: Mental Health Policy 3 hours.
Critical analysis of policies and structures in mental health delivery system with focus on urban and chronically mentally ill populations.
Prerequisite(s): SOCW 420.

556
Policy II: Community and Administrative Practice 3 hours.
Critical analysis of national, state, and local policies affecting urban community building and development. **Prerequisite(s):** SOCW 420.

558
Social Work and the Law 3 hours.
Social work input in legal system: family law, family violence, crime,

delinquency, civil rights, education, health, mental health, social advocacy, social work practice regulation.
Prerequisite(s): SOCW 420 or consent of the instructor.

559
Independent Study in Social Welfare Policy and Services 1 TO 3 hours.
Independent study in social welfare policy and services areas not covered by existing course offerings. May be repeated to a maximum of 6 hours. **Prerequisite(s):** Consent of the instructor and approval of the college.

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(s): 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(s): SOCW 460 or consent of the instructor.

567
Research Project 0 TO 9 hours.
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. Satisfactory/Unsatisfactory grading only. May be repeated.
Prerequisite(s): SOCW 460 or consent of the instructor; and approval of the college.

569
Independent Study in Research 1 TO 3 hours.
Independent study in research methodology or areas not covered by existing course offerings. May be repeated to a maximum of 6 hours.
Prerequisite(s): Consent of the instructor and approval of the college.

570
Field Instruction I 5 hours.
Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macrosystem cases are carried for social work services. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): Consent of the instructor.

571
Field Instruction II 5 hours.
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. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** SOCW 570 and consent of the instructor.

572
Field Instruction III 8 hours.
Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macrosystem cases are carried for social work services. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): SOCW 571 and consent of the instructor.

573
Field Instruction IV 8 hours.
Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macrosystem cases are carried for social work services. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): SOCW 572 and consent of the instructor.

574
Special Studies in Field Instruction I 2 TO 4 hours.
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. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): Consent of the instructor.

575
Special Studies in Field Instruction II 2 TO 4 hours.
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. Satisfactory/Unsatisfactory grading only.
Prerequisite(s): Consent of the instructor.

577
Social Welfare History 3 hours.
Social work history in context of political, economic, and social developments; focus on gender, class, and race; critical application of theoretical models. **Prerequisite(s):** Admission to the PhD in Social Work program or consent of the instructor.

579
Integrative Seminar 2 hours.
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. May be repeated to a maximum of 4 hours.

Prerequisite(s): Concurrent registration in SOCW 575 and consent of the instructor.

580
Practice III: Community and Administrative Practice 3 hours.
Management of human service organizations; resource acquisition and management; planning; community relations; focus on urban, community-based agencies.
Prerequisite(s): SOCW 431.

581
Practice IV: Community and Administrative Practice 3 hours.
Advanced urban community building and developing; emphasis on poor, at-risk communities.
Prerequisite(s): SOCW 580.

582
Practice III: Practice with Children and Families 3 hours.
Ecological and strengths-based practice with urban children and families; special focus on child welfare. **Prerequisite(s):** SOCW 431.

583
Practice IV: Practice with Children and Families 3 hours.
Advanced critical analysis and application of ecological and strengths-based practice emphasizing interactions of children and families with urban courts, schools, and child welfare systems. **Prerequisite(s):** SOCW 582.

584
Practice III: Healthcare 3 hours.
Theoretical basis and skills for health social work in diverse settings; biopsychological understanding of health and disease; emphasis on direct practice with urban clients and families. **Prerequisite(s):** SOCW 431.

585
Practice IV: Healthcare 3 hours.
Advanced knowledge and skills in healthcare settings; specific populations, including urban poor and at-risk populations; emphasis on urban community and organizational levels.
Prerequisite(s): SOCW 584.





586

Practice III: Mental Health 3 hours. Strengths-based assessment and treatment planning in urban settings; diversity issues; managed care settings; critical use of current mental health diagnostic and classification systems. **Prerequisite(s):** SOCW 431.

587

Practice IV: Mental Health 3 hours. Advanced urban mental health practice; diversity issues; focus on children and adolescents and their families; critical application of current mental health diagnosis and classification. **Prerequisite(s):** SOCW 586.

588

Practice III: School Social Work 3 hours. Ecological and strengths-based perspectives on development of basic competencies for urban school social work; diversity issues. **Prerequisite(s):** SOCW 431.

589

Practice IV: School Social Work 3 hours. Advanced interventions in urban school systems; use of groups, consultation, classroom interventions, family empowerment, conflict resolution, and community interventions; diversity issues. **Prerequisite(s):** SOCW 588.

590

Analysis of Social Work Practice Approaches 3 hours. Historical and current developments in the conceptualization of social work practice. Implications of practice approaches for contributing to social justice. Values and ethics addressed. Extensive computer use required. **Prerequisite(s):** Admission to the PhD in Social Work program or consent of the instructor.

591

Social Welfare Policy Analysis and Development 3 hours. Analysis of social welfare policies with particular attention to issues of social and economic justice; conceptual models for analysis; application of models to selected problems. **Prerequisite(s):** Admission to the PhD in Social Work program or consent of the instructor.

592

Models of Social Work Scholarship and Knowledge Development 3 hours. Functions of scholarship in social work, contributions of scholarship to social and economic justice, research methodologies, and knowledge building processes for practice and policy analysis. Extensive computer use required.

Prerequisite(s): Admission to the PhD in Social Work program or consent of the instructor.

593

Quantitative Methods in Social Work Research 3 hours. Selected statistical and analytical methods as applied to social issues. Use of computerized tools, sampling, hypothesis testing, descriptive and inferential procedure, introduction to multivariate analysis. Extensive computer use required. **Prerequisite(s):** Admission to PhD in Social Work program or consent of the instructor.

594

Dissertation Proseminar in Social Work 3 hours. Preparation in development of dissertation focus and planning of dissertation research. Readings are assigned and discussed in class. Emphasis on ideas for dissertation topic, its formulation, operationalization, and research design. **Prerequisite(s):** SOCW 592 and SOCW 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. Students must participate in a teaching laboratory. **Prerequisite(s):** Admission to the PhD in Social Work program.

596

Proseminar on Selected Topics and Issues in Social Work 2 TO 4 hours. Review and critique of selected areas of social work content, theory, or practice. State of current knowledge and needed research stressed. May be repeated. **Prerequisite(s):** Admission to the PhD in Social Work program.

599

PhD Thesis Research 0 TO 16 hours. Individual research, under faculty direction, on social work doctoral dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Consent of the instructor.

Sociology (SOC)

400

Sociological Analysis 0 TO 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SOC 201 and SOC 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 0 TO 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SOC 201 and SOC 202; or consent of the instructor.

402

Intermediate Sociological Statistics 0 TO 4 hours. The general linear model emphasizing regression. Analysis of variance and covariance. Simple structural equation models. Simple categorical methods. Elementary matrix algebra. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SOC 401.

405

Writing in the Social Sciences 3 OR 4 hours. Leads to effective, clear writing for a social science audience. Teaches how to organize ideas, avoid tiresome jargon, and write with precision. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division social science courses.

424

Sociology of Gender 3 OR 4 hours. Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family, economy. **Same as** GWS

425. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology or gender and women's studies courses or consent of the instructor.

425

Race and Ethnic Relations 3 OR 4 hours. Critical examination of the conceptual frameworks and empirical findings in the study of race and ethnic relations. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology, including SOC 225, or consent of the instructor.

426

Topics in Race and Ethnic Relations 3 OR 4 hours. Intensive examination of a specialized topic announced when the class is scheduled. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of upper-division sociology, including SOC 225, or consent of the instructor.

440

Topics in Organizations and Institutions 3 OR 4 hours. Intensive examination of a specialized topic announced when the class is scheduled. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

441

Social Stratification 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): 6 hours of upper-division sociology or consent of the instructor.

445

Sociology of the Family 3 OR 4 hours. Variety and change in family patterns; family formation and breakup; parents' and childrens' effects on each other; influences of culture and political economy; consequences for other institutions. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

446
Race, Ethnicity, and Gender in American Religion 3 OR 4 hours.
 Religious institutions in the U.S. as a crucible for racial, ethnic, and gender identities, group formation, and intergroup relations; major world religions represented in the U.S.
Same as RELS 446. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): SOC 100 and junior standing or above; or consent of instructor.

447
Organizations 3 OR 4 hours.
 Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. **Same as** MGMT 447. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology, management, or political science; or consent of the instructor.

448
Sociology of Development 3 OR 4 hours.
 Historical, economic, political, social, and geographic factors shaping national and international development experiences and outcomes. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division social science courses or consent of the instructor.

451
Medical Sociology 3 OR 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. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): 6 hours of upper-division sociology or consent of the instructor.

455
Topics in Medical Sociology 3 OR 4 hours.
 Intensive examination of a specialized topic announced when the class is scheduled. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.
Prerequisite(s): SOC 451 or consent of the instructor.

465
Topics in Sociology of Politics 3 OR 4 hours.
 Intensive examination of a specialized topic announced when the class is scheduled. **Same as** POLS

465. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

471
Population 3 OR 4 hours.
 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. **Same as** EPID 471. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology, including SOC 201, or consent of the instructor.

473
Cities and Regions 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology, including SOC 201, or consent of the instructor.

476
Topics in Urban Sociology 3 OR 4 hours.
 Intensive examination of a specialized topic announced when the class is scheduled. 3 undergraduate hours. 4 graduate hours. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

485
Classical Sociological Theory 3 OR 4 hours.
 Survey and analysis of classical European and American social theory, such as Marx, Weber, Durkheim, Veblen, and Park. 3 undergraduate hours. 4 graduate hours.
Prerequisite(s): 6 hours of upper-division sociology or consent of the instructor.

487
Contemporary Sociological Theory 3 OR 4 hours.
 Review and evaluation of major currents in sociological theory since the 1940s. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 6 hours of upper-division sociology or consent of the instructor.

488
Theories in Social Psychology 3 OR 4 hours.
 In-depth treatment of major theoretical traditions in social psychology. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SOC 110 or SOC 410 or consent of the instructor.

496
Independent Study or Research 1 TO 9 hours.
 Extensive readings in specialized areas of sociology or empirical research for advanced undergraduate or graduate students. May be repeated with approval. Students may register in more than one section per term. Approval to repeat course granted by the department. Undergraduate students may repeat course for maximum of 9 hours of credit. **Prerequisite(s):** 18 hours of sociology, excluding SOC 296 and SOC 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(s): SOC 500.

509
Seminar: Sociological Research Methods 0 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. Students register for 1 to 7 hours.

520
Seminar: Race, Ethnicity, and Gender 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

528
Societal Analysis of Aging, Health, and Healthcare 3 hours.
 Analysis of aging, health, and healthcare issues mainly from sociological and public health perspectives. Review and application of

appropriate concepts, theories, and methods. **Same as** CHSC 528.
Prerequisite(s): CHSC 425 or consent of instructor.

540
Seminar: Social Institutions 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

547
Seminar: Social Organization 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

548
Seminar: Comparative Societies 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated. Students may register in more than one section per term.

550
Proseminar on Current Research in Health, Illness, and Medicine 4 hours.
 Review and critique of current research in the following health areas: healthcare systems, social epidemiology and health and illness behavior. **Prerequisite(s):** SOC 451.

551
Seminar: Sociology of Health and Medicine 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.
Prerequisite(s): Consent of the instructor.

565
Seminar: Political Sociology 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

571
Seminar: Population and Human Ecology 1 TO 7 hours.
 Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

572
Sociology of Education 4 hours.
 Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education,



inequality and educational reform.

Same as PS 572.

Prerequisite(s): Enrollment in the PhD in Policy Studies in Urban Education program or consent of the instructor.

585

Seminar:

Sociological

Theory 1 TO 7 hours. Intensive analysis of specialized topics. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

593

Colloquium on

College Teaching

of Sociology 0 TO 4 hours.

Sociological analysis of contemporary university teaching; strategies and techniques for presentation of sociology at the college level. May be repeated.

595

Departmental

Seminar

1 TO 4 hours.

Presentation and discussion of issues of professional concern to sociologists, including current research, consulting, teaching, and applied sociology. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

596

Independent

Study 1 TO 12 hours.

Research on special problems not included in the graduate thesis. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the instructor and approval of the department.

597

Project

Research 0 TO 16 hours.

Supervised writing and research on topic of the master's paper. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 6 hours. **Prerequisite(s):** SOC 501 and consent of the instructor.

599

Thesis

Research 0 TO 16 hours.

Research and writing of the PhD thesis. Satisfactory/Unsatisfactory grading only. May be repeated.

Spanish (SPAN)

400

History of the Spanish

Language 3 OR 4 hours.

Origins and development of Spanish; phonological, morphological, syntactic development of the language; foreign influences; origin of dialects. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN

205 or SPAN 300 or consent of the instructor.

402

Spanish

Syntax

3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 305 or consent of the instructor.

403

Advanced

Spanish

Syntax

3 OR 4 hours.

Structure of the grammatical system of Spanish. In-depth analysis of selected syntactic phenomena. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 402 or the equivalent or consent of the instructor.

404

Spanish

Phonology and

Morphology 3 OR 4 hours.

Analysis of the phonological and morphological structure of Spanish. Emphasis on the production and mental representation of sounds. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 205 or the equivalent.

405

Advanced Spanish

Phonology and

Morphology 3 OR 4 hours.

Advanced and detailed study of the phonological and morphological structure of Spanish. Emphasis on current theories. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 404 or the equivalent or consent of the instructor.

406

Spanish

Sociolinguistics 3 OR 4 hours.

Past and current theoretical and empirical sociolinguistics as applied to the study of variation within Spanish and U.S. Hispanic communities. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 402 or SPAN 404 or consent of the instructor.

408

Hispanic

Dialectology 3 OR 4 hours.

Descriptive and historical analysis of the most salient linguistic phenomena of peninsular and American Spanish dialects. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 300 or SPAN 404 or the equivalent.

410

Spanish

Medieval

Literature 3 OR 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*. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 310.

412

Literary Forms in

the Early Spanish

Golden Age 3 OR 4 hours.

Renaissance and sixteenth-century lyric poetry: examples of picaresque, pastoral, and mystical prose. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 310.

413

Literary Forms in the

Later Spanish

Golden Age 3 OR 4 hours.

The *comedia*; culteranismo and conceptismo; the prose of Quevedo and Gracian. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 310.

414

Don Quijote

3 OR 4 hours.

Detailed study of the text; novelistic techniques and influence on the development of the novel. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s):

SPAN 310.

421

Modern Spanish

Literature II: From

Unamuno to

Garcia Lorca 3 OR 4 hours.

Representative authors and tendencies from the end of the nineteenth century to the outbreak of the Civil War. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 311.

422

Contemporary Spanish

Literature: From Cela to the

Present 3 OR 4 hours.

The most important authors and tendencies in twentieth-century Spain. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 311.

427

Studies in Language

Policy and Cultural

Identity 3 OR 4 hours.

Examines the development, articulation, and effects of language policies on identity formation and culture. Focuses on the United States and the Spanish language, although other countries and languages are included. **Same as** LALS 427. 3 undergraduate hours. 4 graduate hours. Taught in English.

Prerequisite(s): Junior standing

or above. Reading and writing knowledge of Spanish.

430

Spanish American

Literature of the

Colonial Period 3 OR 4 hours.

Conquest to Independence. From the narrative of Discovery, Conquest, and indigenous traditions, to Renaissance epic, Baroque hours. 4 graduate hours.

Prerequisite(s): SPAN 312.

431

Modern

Spanish American

Literature I 3 OR 4 hours.

Nineteenth-century literary trends from the beginnings of the novel through Romanticism and Realism to Modernismo. Prose and poetry. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s):

SPAN 312.

432

Modern Spanish

American

Literature II 3 OR 4 hours.

Representative authors and movements from post-modernismo through Vanguardism and the tendencies of the last twenty years. Emphasis on poetry. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 312.

433

Modern Spanish

American

Narrative 3 OR 4 hours.

The development of fiction in Spanish America from the Romantic era to the neorealist novel and short story of the 1930s. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): SPAN 312.

434

Contemporary

Spanish American

Narrative 3 OR 4 hours.

Emergence of the New Fiction. Representative works of the 1940s from South and Central America, Mexico, and the Caribbean, through contemporary developments of the "Boom." 3 undergraduate hours. 4 graduate hours.

Prerequisite(s):

SPAN 312.

435

Advanced Topics in

Hispanic

Literature 3 OR 4 hours.

Intensive study of a particular genre, theme, author, or period within Spanish, Latin American, or Latino literature with emphasis on literary analysis and critical writing. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPAN 210 and SPAN 211; and consent of the instructor.



436
Special Topics in the Teaching of Spanish 1 TO 4 hours.

Course content is announced prior to each term in which course is given. May be repeated. Students may register in more than one section per term. Taught in English. Some semesters may be taught in Spanish. **Prerequisite(s):** Approval of the department.

448
Foundations of Second Language Teaching 3 OR 4 hours.

Provides an introduction to second language acquisition research and its implications for communicative language teaching. Emphasis is on creating activities to develop high school students' communicative abilities in speaking and listening. **Same as** FR 448 and GER 448. 3 undergraduate hours. 4 graduate hours. Taught in English.

Prerequisite(s): Junior standing or above; and consent of the instructor and three courses at the 200- and 300-levels.

449
Teaching Second Language Literacy and Cultural Awareness 3 OR 4 hours.

Examines the nature of literacy as a reciprocal relationship between readers, writers, texts, and culture. Students learn the practical and theoretical foundations of classroom teaching of second language reading and writing skills. **Same as** FR 449 and GER 449. 3 undergraduate hours. 4 graduate hours. Taught in English. **Prerequisite(s):** Junior standing or above; and consent of the instructor.

451
Educational Practice with Seminar I 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, and approval of the department.

452
Educational Practice with Seminar II 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Graduate credit only with approval of the

department. **Prerequisite(s):** Good academic standing in a teacher education program, completion of 100-clock hours of pre-student-teaching field experiences, credit or concurrent registration in SPAN 451, and approval of the department.

494
Special Topics 3 OR 4 hours.

Topics will vary from term to term and may cover such areas as literary theory or culture. **Same as** FR 494 and ITAL 494. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term. Taught in English. **Prerequisite(s):** Junior standing or above; and approval of the department.

500
Research in Hispanic Studies 4 hours.

Basic concepts of linguistic and literary theory; introduction to areas of research in linguistics and literature. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Admission to the graduate program in Hispanic studies or consent of the instructor.

502
Theoretical and Research Foundations of Communicative Language Teaching 4 hours.

Introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice.

Same as FR 502. Credit is not given for FR 502/SPAN 502 if the student has credit for SPAN 450 or FR 450 or GER 407. Taught in English. **Prerequisite(s):**

Appointment as a teaching assistant. For students outside the department: consent of the instructor.

505
Seminar in Spanish Descriptive Linguistics 4 hours.

Topics in phonology, morphology, syntax, semantics, or pragmatics of Spanish. May be repeated to a maximum of 8 hours.

Prerequisite(s): One 400-level Spanish course, and one from SPAN 402, SPAN 404, SPAN 408; or consent of the instructor.

507
Seminar in Second Language Acquisition and Bilingualism 4 hours.

Current theoretical and research directions of bilingualism and second language acquisition by non-natives. May include original empirical research projects. May be repeated to a maximum of 8 hours.

510
Seminar in Spanish Medieval Literature 4 hours.

An intensive study of relevant genres, periods, figures, and movements of Spanish medieval literature. May be repeated to a maximum of 8 hours.

512
Seminar in Golden Age Literature 4 hours.

Particular areas, genres, works, or figures, in sixteenth- and seventeenth-century Spanish literature. May be repeated to a maximum of 8 hours.

520
Seminar in Modern Spanish Literature 4 hours.

Particular areas, genres, works, or figures in Modern Spanish literature. May be repeated to a maximum of 8 hours.

530
Seminar in Spanish American Literature 4 hours.

Intensive study of relevant genres, periods, figures, and movements in Spanish-American literature. May be repeated to a maximum of 8 hours.

535
Concepts and Methodologies in Hispanic Interdisciplinary Studies 4 hours.

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. May be repeated to a maximum of 8 hours.

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.

Prerequisite(s): One 400-level Spanish course and two from SPAN 402, SPAN 404, SPAN 406, and SPAN 408.

556
Second Language Learning 4 hours.

An introduction to research findings and methods in second language learning. **Same as** LING 556.

Prerequisite(s): Consent of the instructor.

557
Theories in Second Language Acquisition 4 hours.

Review of current linguistic, cognitive, and sociocultural theories with the following in mind: what do these

theories purport to explain? What methodologies are used by researchers working within the theories? Taught in English.

Recommended background: LING 556.

570
Seminar in Literary Theory and Criticism 4 hours.

Theories of literary production and reception; their application to the practice of literary criticism. Specific themes and topics vary. **Same as** FR 570. May be repeated to a maximum of 8 hours with approval. Approval to repeat course granted by the instructor. Taught in English.

594
Special Topics in Hispanic Studies 4 hours.

Topics which involve multiple approaches to problems in linguistics and literature, or which cross the chronological and geographical boundaries established in the seminars. May be repeated to a maximum of 8 hours.

596
Independent Study 1 TO 4 hours.

Provides for areas of study not regularly covered by departmental offerings. Study proposals must conform to departmental guidelines. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

598
MA Thesis Research 0 TO 16 hours.

Students involved in thesis research and writing are assigned to the course at the discretion of the graduate committee. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Approval of the graduate committee.

599
PhD Thesis Research 0 TO 16 hours.

The writing of a PhD thesis based on original research in the area of the candidate's major specialization (literature, linguistics, or culture).

Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 24 hours. **Prerequisite(s):** 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(s):** ED 210 or ED 421 or graduate standing and consent of the instructor.

415 Characteristics of Exceptional Learners 3 hours.

Provides a foundation for the understanding of the exceptional learner in an inclusive environment. No graduation credit for students enrolled in a secondary education, social work, or any graduate degree program. **Prerequisite(s):** Junior standing or above and admission to the Bachelor of Arts in Elementary Education program or consent of the instructor.

416 Methods of Instruction for Exceptional Learners 2 hours.

The purpose of this course is to address issues of instruction for individuals with special needs. Topics include effective instructional and accommodative practices and strategies in multiple areas (math, literacy, science, social studies, art). **Prerequisite(s):** Junior standing or above and Admission to the Bachelor of Arts in Elementary Education program. Successful completion of SPED 415.

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(s):** Graduate standing; and SPED 410 or the equivalent.

424 Assessment of Students with Special Needs 3 OR 4 hours.

Theoretical basis and practical application of standardized and alternative testing of children with learning and behavior difficulties. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPED 410

426 Curricular/Behavioral Considerations for Learners with Special Needs 3 OR 4 hours.

Instructional practices related to academics, classroom management, individualized and group instruction for students with special needs. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** 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(s):** Graduate standing; and SPED 410 or the equivalent or consent of the instructor.

442 Language Development and Disorders 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** SPED 410

444 Assistive Technology for Literacy, Learning, and Participation in Pre-K through High School 3 hours.

Use of communication systems, computers, adapted equipment, and strategies to foster participation and inclusion of students in grades pre-school through high school. **Same as** DHD 444.

448 Topics in Special Education 1 TO 4 hours.

Course or workshop on preannounced topic on the education of handicapped children, adolescents, or adults. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** SPED 410 and consent of the instructor.

461 Political and Sociocultural Perspectives on Special Education 3 hours.

Students will examine issues of access and equity through legislation, litigation, and sociocultural perspectives and be introduced to major theoretical frameworks that

influence special education programs. **Same as** ED 461. Fieldwork required.

462 Assessment of Individuals with Disabilities 3 hours.

To prepare students in the use of formal and informal assessment in making decisions regarding placement, instructional planning, and evaluation of students with disabilities. Fieldwork required.

Prerequisite(s): ED 461 or SPED 461 or the equivalent or consent of the instructor.

463 Instructional Adaptations in Reading and Writing I 3 hours.

Emphasizes the components of designing, implementing, and assessing reading and writing instruction for individuals with disabilities at the elementary level. Fieldwork required.

Prerequisite(s): ED 461 or SPED 461 or the equivalent or consent of the instructor.

465 Cognitive Development and Disabilities 3 hours.

Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and intervention. **Same as** EPSY 465. Fieldwork required.

Prerequisite(s): SPED 461 or ED 461 or the equivalent or consent of the instructor.

466 Language Development, Diversity, and Disabilities 3 hours.

Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention. **Same as** EPSY 466. Fieldwork required.

467 Social and Emotional Development and Disabilities 3 hours.

Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5–21 with and without disabilities. **Same as** EPSY 467. Fieldwork required. **Prerequisite(s):** SPED 461 or ED 461 or the equivalent or consent of the instructor.

471 Curricular Adaptations for Learners with Significant Disabilities 3 hours.

Addresses methods of instruction, assessment, planning for instruction, development and evaluation of learning environments, and instructional delivery for students with significant disabilities. Fieldwork required. **Prerequisite(s):** SPED 465 and SPED 466 and SPED 467; or consent of the instructor.

472 Promoting Academic and Prosocial Behavior I 3 hours.

The importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. **Same as** ED 472. Fieldwork required.

Prerequisite(s): SPED 461 or ED 461 or the equivalent or consent of the instructor.

473 Teaching Math and Science with Adaptations 3 hours.

Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. **Same as** ED 473. Fieldwork required. **Prerequisite(s):** SPED 461 or ED 461 or the equivalent or consent of the instructor.

480 Technology and Multimedia: Learning Tools in the Classroom 3 OR 4 hours.

New technologies to support teaching and learning in precollege classrooms. **Same as** CIE 480. 3 undergraduate hours. 4 graduate hours.

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(s):** Graduate standing; and 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(s):** SPED 410 or consent of the instructor.



506
Characteristics and Assessment of Young Children with Disabilities 4 hours.

Biological and environmental factors in infancy may cause developmental disabilities. Impact of such factors on child development will be reviewed. Appropriate assessment techniques reviewed. Fieldwork required.

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(s):** SPED 506 or SPED 511 or SPED 513 or SPED 515.

508
Methods of Instruction & Assessment of Young Children with Disabilities 4 hours.

Intervention and assessment methods for infants and young children at-risk for or showing developmental delays. Systems perspective on utilizing family and community to support intervention. Fieldwork required. **Prerequisite(s):** Grade of B or better in SPED 506; or consent of the instructor.

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. Fieldwork required. **Prerequisite(s):** 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. Fieldwork required.

Prerequisite(s): 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. Fieldwork required. **Prerequisite(s):** 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. **Prerequisite(s):** 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 students with moderate, severe, and profound mental retardation. Fieldwork required. **Prerequisite(s):** SPED 513 and concurrent registration in SPED 514.

516
Characteristics of Students with Emotional and Behavioral Disorders 3 hours.

Exploration of the risk factors and different theoretical approaches associated with the development and prevention of serious emotional and behavioral disorders. Fieldwork required. **Prerequisite(s):** SPED 424 and SPED 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. Fieldwork required. **Prerequisite(s):** SPED 516.

522
Special Educator as Consultant 4 hours.

Training for consultants in educational and employment settings: consultation models, observation, and coaching skills to use with educators, parents, employers, and community-agency personnel. **Prerequisite(s):** SPED 410 or the equivalent or consent of the instructor.

537
Special Education Practicum 6 TO 12 hours.

Practice teaching in the field of special education; focus on teaching students who are experiencing social and/or emotional disturbance, mental retardation, or learning disabilities. **Prerequisite(s):** 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 adviser. Applications are due two semesters in advance.

538
Internship in Special Education 1 TO 9 hours.

Clinical, research, or field-based internship experiences for special education majors. May be repeated. Students may register in more than one section per term.

Prerequisite(s): SPED 424 and SPED 426 and SPED 500 and consent of the instructor one semester prior to enrollment.

564
Proseminar in Special Education 4 hours.

Various areas of special education research are reviewed. Topics include areas of faculty research. **Prerequisite(s):** SPED 500 or consent of the instructor; and admission to PhD in Special Education program.

572
Promoting Academic and Prosocial Behavior II 2 hours.

Provides an in-depth examination of serious problem behavior and the skills to develop individualized programs to address the academic and social needs of challenging students. Fieldwork required. **Prerequisite(s):** SPED 472; or consent of the instructor.

573
Understanding Research in Special Education 3 hours.

Overview of research methodology appropriate for teachers of special populations with emphasis on developing skills in critically reading research reports. **Prerequisite(s):** ED 461 or SPED 461 or the equivalent or consent of the instructor.

576
Internship in Assessment 3 hours.

Internship experiences in an assessment clinic for special education majors. Fieldwork required. **Prerequisite(s):** SPED 462 or the equivalent or consent of the instructor.

577
Field Teaching Internship Experience 3 hours.

Field-based internship experiences for special education. Fieldwork required. **Prerequisite(s):** Approval of the program faculty.

578
Classroom-Based Inquiry Internship 3 hours.

Field-based internship experiences in special education classrooms. Fieldwork required. **Prerequisite(s):** Approval of the program faculty.

579
Research Internship 3 hours.

Students work on a specific research project under the direction of a faculty member. Fieldwork required. **Prerequisite(s):** SPED 573 or the equivalent and consent of the instructor.

580
Student Teaching in Special Education 6 hours.

Practice teaching in the field of special education. Fieldwork required. **Prerequisite(s):** SPED 463 and SPED 471 and SPED 473 and SPED 572 and SPED 573 and SPED 576 and SPED 577 and approval of the program faculty.

582
Forging Collaborations with Family and Community 3 hours.

Develops skills necessary to work in partnership with the families of children with disabilities, and community members. **Same as** EPSSY 582. **Prerequisite(s):** ED 461 or SPED 461 or the equivalent or consent of the instructor.

583
Instructional Adaptations in Reading and Writing II 3 hours.

Students learn advanced strategies for designing, implementing, and assessing reading and writing instruction for individuals with disabilities at the middle school and secondary level. Fieldwork required. **Prerequisite(s):** ED 461 or SPED 461; and SPED 463; or consent of the instructor.

592
Seminar on Theory and Research in Special Education 4 hours.

Systematic in-depth review of theory and research on selected topics in special education. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** SPED 500 and consent of the instructor.

593
PhD Research Project 1 TO 8 hours.

Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. May be repeated to a maximum of 8 hours. **Prerequisite(s):** Admission to the PhD in Education program.

595
Seminar in Special Education 4 hours.

Discussion of current literature in the field of special education.



Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** SPED 564.

596**Independent****Study 1 TO 4 hours.**

Students independently study related topics not covered by courses, under faculty supervision. May be repeated to a maximum of 12 hours. Students may register in more than one section per term.

Prerequisite(s): SPED 500 or the equivalent, and consent of adviser and instructor.

599**Thesis****Research 0 TO 16 hours.**

Research on the topic of the student's dissertation. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Consent of the dissertation adviser.

Statistics (STAT)**401****Introduction to****Probability 3 OR 4 hours.**

Probability spaces, random variables and their distributions, conditional distribution and stochastic independence, special distributions, sampling distributions, limit theorems. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 210.

411**Statistical****Theory 3 OR 4 hours.**

Estimation, tests of statistical hypotheses, best tests, sufficient statistics, Rao-Cramer inequality, sequential probability ratio tests, the multivariate normal distribution, non-parametric methods. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in STAT 401.

416**Nonparametric****Statistical****Methods 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in STAT 381 or STAT 411.

431**Introduction to****Survey****Sampling 3 OR 4 hours.**

Simple random sampling; sampling proportions; estimation of sample size; stratified random sampling; ratio estimators; regression estimators; systematic and cluster sam-

pling. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in STAT 411 or STAT 481.

461**Applied Probability****Models I 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in STAT 401.

462**Applied Probability****Models II 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in STAT 461.

471**Linear and****Nonlinear****Programming 3 OR 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. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in MATH 310.

473**Game Theory 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in MATH 310 or STAT 401.

477**Introduction to****Reliability****Theory 3 OR 4 hours.**

Structural and probabilistic properties of coherent systems, notions of aging and classes of life distributions, preservation properties, dependent components, optimal allocation models. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of C or better in STAT 401 or consent of the instructor.

481**Applied Statistical****Methods II 3 OR 4 hours.**

Linear regression, introduction to model building, analysis of variance, analysis of enumerative data, non-parametric statistics, product and system reliability, quality control. SAS and SPSSX applications. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in STAT 381.

486**Statistical****Consulting 3 OR 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. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of C or better in STAT 411 or STAT 481.

494**Special Topics in****Statistics, Probability,****and Operations****Research 3 OR 4 hours.**

Course content 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. 3 undergraduate hours. 4 graduate hours. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the department.

496**Independent****Study 1 TO 4 hours.**

Reading course supervised by a faculty member. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the instructor and approval of 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(s): 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(s):** 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(s):** 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(s): 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(s): 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(s):** 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(s): 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(s):** 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(s): 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(s): STAT 535 or consent of the instructor.

571

Noncooperative Games

4 hours.

Extensive games. Separation and fixed point theorems. General minimax theorems. Nash equilibria. War duels. Completely mixed games. Games with convex payoff. Stochastic games.

Prerequisite(s): STAT 461 or MATH 411.

572

Cooperative Game Theory

4 hours.

Utility theory. Games with side payments, stable sets, core, bargaining sets, Shapley value, Nucleolus. Market games. NTU value.

Multilinear extensions, non-atomic games. **Prerequisite(s):** STAT 571 or consent of the instructor.

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(s):** STAT 461.

591

Advanced Topics in Statistics, Probability, and Operations Research

4 hours.

Special topics. Topics drawn from areas such as: data analysis; Bayesian inference; nonlinear models; time series; computer-aided design; reliability models; game theory. May be repeated.

Prerequisite(s): Approval of the department.

593

Graduate Student Seminar

1 hour.

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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term.

Prerequisite(s): Approval of the department.

595

Research Seminar 1 hour.

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. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

596

Independent Study

1 TO 4 hours.

Reading course supervised by a faculty member. May be repeated.

Students may register in more than one section per term.

Prerequisite(s): Approval of the instructor and the department.

598

Master's Thesis

0 TO 16 hours.

Research work under the supervision of a faculty member leading to the completion of a master's thesis. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Approval of the department.

599

Doctoral Thesis Research

0 TO 16 hours.

Research work under the supervision of a faculty member leading to the completion of a doctoral thesis. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of the department.

Surgery (SURG)

597

Project Research

0 TO 16 hours.

Research investigation of problems in surgery. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

598

Master's Thesis Research

0 TO 16 hours.

Research investigation of problems in surgery. Satisfactory/Unsatisfactory grading only.

Prerequisite(s): Consent of the instructor.

Theatre (THTR)

410

Movement for Stage III

3 OR 4 hours.

Specialized topics in movement-based performance skills, such as stage combat, circus techniques, and mask work. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of B or

better in THTR 310 and advanced physical performance experience; or graduate standing in theatre.

423

Playwriting 3 OR 4 hours.

The development of scripts for stage performance. **Same as ENGL 495.** 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Junior standing or above; and approval of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.

444

Drama in Its Cultural Context I

3 OR 4 hours.

Drama in its social and cultural context through the seventeenth century. 3 undergraduate hours. 4 graduate hours.

445

Drama in Its Cultural Context II

3 OR 4 hours.

Drama in its social and cultural context eighteenth to twentieth centuries. 3 undergraduate hours. 4 graduate hours.

452

Acting: Greeks and Shakespeare 3 OR 4 hours.

Techniques of performing Greek and Shakespearean drama. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of B or better in THTR 261 and grade of B or better in THTR 262 or graduate standing in theatre.

455

Acting: Comedy 3 OR 4 hours.

Techniques of performing classic comedy. Emphasis on the "Commedia dell'arte" and improvisational comedy. Topics vary. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of B or better in THTR 262 or graduate standing in theatre.

458

Acting: Ibsen and Chekhov 3 OR 4 hours.

Techniques of performing Ibsen, Chekhov, and their contemporaries. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of B or better in THTR 262 or graduate standing in theatre.

462

Voice for Stage 3 OR 4 hours.

Advanced techniques in the integration of voice, speech, dialects, and other text-related vocal performance skills. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Grade of B or better in THTR 261 or graduate standing in theatre.

464

Special Projects in Theatrical Design

3 OR 4 hours.

Twentieth-century styles: design for the contemporary stage. Problems in conceptualization, realization, and execution. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times. **Prerequisite(s):** THTR 250 or THTR 256; or THTR 257 and THTR 259; or graduate standing in theatre.

465

Stage Direction

3 OR 4 hours.

Exploration of conceptual planning and implementation skills for the stage director, ranging from script interpretation to rehearsal and performance. Performance projects required. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** THTR 210 and THTR 250 and THTR 262; and THTR 256 or THTR 257 or graduate standing in theatre.

466

Special Projects in Performance Training

3 OR 4 hours.

Training in varying advanced techniques of performance. 3 undergraduate hours. 4 graduate hours. May be repeated up to 2 times.

Prerequisite(s): THTR 262; or for graduate students, consent of the instructor.

470

Contemporary Performance Techniques

3 OR 4 hours.

The relationship of contemporary theory and performance techniques with attention to both text and non-text based forms. Topics vary. Performance projects required. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time. **Prerequisite(s):** Grade of B or better in THTR 262; or graduate standing in theatre.

472

Investigative Collaboration

3 OR 4 hours.

Collaboration as the primary means for theatrical creation. Production teams assigned to joint-production projects. Topics vary. 3 undergraduate hours. 4 graduate hours. May be repeated up to 1 time.

Prerequisite(s): Grade of B or better in THTR 262; or graduate standing in theatre.

474

Internship 3 TO 8 hours.

Students work in an approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. May be repeated. Only three hours may be applied toward theatre





major requirements.

Prerequisite(s): 12 hours of upper-division courses in theatre, with a 3.00 grade point average in those courses; recommendation of two faculty members and approval of department obtained in semester prior to internship.

475

Audition Technique 3 OR 4 hours. Selection and staging of audition pieces from both classical and modern drama. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Grade of B or better in THTR 261 and grade of B or better in THTR 452 and grade of B or better in THTR 210; or graduate standing.

491

Study Abroad in Theatre 0 TO 16 hours.

Study abroad within an approved foreign exchange program or department-sponsored program. May be repeated with approval. Approval to repeat course granted by the department.

Prerequisite(s): Approval of the department.

498

Independent Study 1 TO 4 hours.

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. May be repeated to a maximum of 6 hours. Students may register in more than one section per term.

Prerequisite(s): Senior or graduate standing and approval of the department.

502

Introduction to Research in Theatre 4 hours.

Focuses on the research directors and scholars need to make informed choices.

522

Theories of Theatre 4 hours.

Nature of the theatrical experience. Emphasis on topics varies. For example, theory of comedy; semiotics of theatre; dada, surrealism, expressionism, futurism. May be repeated to a maximum of 12 hours. **Prerequisite(s):** At least three of the following: THTR 209; THTR 245; THTR 262; THTR 284, THTR 425; or consent of the instructor.

523

Special Topics in Dramatic Criticism 4 hours.

Intensive analysis of an individual critic or school, or critical history of

an important play. May be repeated to a maximum of 12 hours.

596

Independent Research 1 TO 4 hours.

Department approved research projects not included in thesis research. May be repeated to a maximum of 6 hours. Students may register in more than one section per term.

Prerequisite(s): Consent of the director of graduate studies.

597

Thesis Production 0 TO 8 hours.

Under the guidance of an adviser and committee, the student creates a theatre or video production, together with a written explanation of the work's intended significance. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Approval of faculty thesis production committee.

598

Thesis Research 0 TO 16 hours.

Under the guidance of an adviser and committee, the student develops and conducts a research project addressing a theatre problem of a basic or applied nature.

Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Approval of faculty thesis research committee.

Urban Planning and Policy (UPP)

403

Introduction to Urban Planning 3 OR 4 hours.

Patterns of city growth, physical, socioeconomic, and environmental issues. Contemporary planning issues. Future of cities. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Advanced undergraduate standing or consent of the instructor.

420

Great Cities: London and Chicago 1 TO 8 hours.

Comparative investigation of urban, economic, social, and political issues in the two global cities. Includes classes, study, and living in London. Fieldwork required.

Prerequisite(s): Junior standing or above and selection by the Office of Study Abroad Admission Committee.

470

Cohort Seminar for Urban Developers 3 OR 4 hours.

Application of the financial calculator, use of spreadsheets, and other tools commonly used in real-estate-based urban development projects.

3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Consent of the instructor.

471

Housing and Community Development for Urban Developers 3 OR 4 hours.

Housing policy at federal, state, and local levels affecting urban housing markets. Emphasis on assessment of market conditions affecting community development decisions. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** UPP 470 or consent of the instructor.

472

Development Finance for Urban Developers 3 OR 4 hours.

Key financial principles of real estate development, particularly those related to the financing of affordable housing. How to develop a real estate pro forma. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Consent of the instructor.

473

Organizational Essentials for Urban Developers 3 OR 4 hours.

Theory and practice of management in public and nonprofit settings. Focus on developing communication, leadership, and legal skills for each step in development. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Consent of the instructor.

474

Community Development Process for Urban Developers 3 OR 4 hours.

Developing affordable housing: development team, acquisition strategy, legal issues, construction management, and project sustainability, as it pertains to different types of housing developments. 3 undergraduate hours. 4 graduate hours.

Prerequisite(s): Consent of the instructor.

475

Sustaining the Housing for Urban Developers 3 OR 4 hours.

Introduces students to a range of management issues: property management and maintenance, resident relations and services, and financial/asset management as it relates to sustaining affordable housing. 3 undergraduate hours. 4 graduate hours. **Prerequisite(s):** Consent of the instructor.

500

History and Theory of Urban Planning 4 hours.

Analysis of the development of the planning field and of the theories

that have been developed for planning for change in the urban community. **Prerequisite(s):** Admission to the Urban Planning and Policy program or consent of the instructor.

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(s):** Graduate standing in the Urban Planning and Policy program, Master of Arts in Real Estate, or consent of the UPP program director.

502

Planning Skills: Computers, Methods, and Communication 4 hours.

Focuses on the use of computers to learn methods and communication skills commonly used in planning practice. **Prerequisite(s):** Graduate standing in the Urban Planning and Policy program or consent of the UPP program director.

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(s): Admission to the Urban Planning and Policy program or consent of the UPP program director.

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(s): Admission to the Urban Planning and Policy program or consent of the UPP program director.

507

Computer Topics in Urban Planning 4 hours.

Specialized computational abilities for various planning areas, including database, project scheduling, statistics, graphics, and simulations. Topics will vary each semester.

Prerequisite(s): Graduate standing in the Urban Planning and Policy program.

508
Geographic Information Systems for Planning 4 hours.

Applications of Geographic Information Systems to urban planning and policy making. **Same as** GEOG 589. **Prerequisite(s):** Graduate standing in Urban Planning and Policy or consent of the instructor.

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(s):** Consent of the instructor.

517
Regional and Metropolitan-Wide Planning 4 hours.

History of regional planning. **Prerequisite(s):** UPP 500.

520
Globalization and International Planning 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(s):** Consent of the instructor.

521
Globalization and International Planning 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(s):** UPP 520 or consent of the instructor.

525
Globalization and International Planning: Special Topics 1 TO 4 hours.

Special topics selected for intensive analysis in international development planning. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** 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(s):** UPP 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(s):** UPP 504.

535
Economic Development: Special Topics 1 TO 4 hours.

Special topics selected for intensive analysis in economic development. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** 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(s):** 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(s):** UPP 504 or UPP 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(s):** Admission to the Urban Planning and Policy program or consent of the UPP program director.

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(s):** 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(s):** UPP 504 or consent of the instructor.

543
Planning for Healthy Cities 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.

544
Urban Revitalization and Gentrification 4 hours.

Special topics selected for intensive analysis in economic development. World War II that is associated with socioeconomic restructure under globalization. The course examines restructure under the new global order and its impact on cities and urban planning and different social groups.

545
Community Development: Special Topics 1 TO 4 hours.

Special topics selected for intensive analysis in community development. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** 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.

Prerequisite(s): UPP 540 and UPP 541 and consent of the adviser and the instructor.

548
Community Development Methods and Techniques 4 hours.

Community development methods, including needs assessment, asset mapping, capacity building, resources mobilization, project planning, and program evaluation. Includes fieldwork. **Prerequisite(s):** Credit or concurrent registration in UPP 540 and credit or concurrent registration in UPP 541 and consent of 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(s):** Admission to the Urban Planning and Policy program or consent of the UPP program director.

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, context of local government and planning process. **Prerequisite(s):** 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(s):** UPP 551.

553
Land Use Law 4 hours.

Legal constraints on land use control; constitutional and statutory principles and judicial review. **Prerequisite(s):** Graduate standing or consent of instructor.

554
Environmental Planning 4 hours.

The relationship of federal and state environmental policies and legislation to urban and regional planning efforts. **Prerequisite(s):** Consent of the instructor.

555
Physical Planning: Special Topics 1 TO 4 hours.

Special topics selected for intensive analysis in such areas as housing and urban design. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

556
Urban Design Studio 8 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(s):** 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(s):** Consent of the instructor.

560 Urban Transportation I: Introduction 4 hours.
Transportation planning and linkages between it and urban land use and regional economic development. Recent trends, traditional problems, and emerging issues.

561 Urban Transportation II: Policy and Methods 4 hours.
Formation and implementation of transportation policy at the national, regional, and local levels. Students will prepare an in-depth study of a major policy issue. **Prerequisite(s):** 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(s):** UPP 561 or consent of the instructor.

563 Transportation Management 4 hours.
Transit system planning, scheduling, pricing policy, and management; traffic control techniques and demand management; paratransit alternatives. **Prerequisite(s):** UPP 560.

565 Transportation: Special Topics 1 TO 4 hours.
Examination of specific and current problems in urban and regional transportation. Topics to be determined at the time the course is offered. May be repeated to a maximum of 8 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

569 Infrastructure Management 4 hours.
Integrated approach to the management of infrastructure systems: design, construction, operations, maintenance, and rehabilitation of facilities. Performance of facilities, approaches to management, and available tools and developing technologies. **Same as** CME 580. **Prerequisite(s):** IE 201 or the equivalent or consent of instructor. **Recommended background:** Familiarity with computer spreadsheets.

580 Dissertation Proposal Workshop 1 hour.
Faculty-led workshop to assist students writing dissertation proposals in identifying their relevant literature, selecting appropriate methods, and demonstrating the significance of their original research. Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours. **Prerequisite(s):** Completion of the first year of the program; and consent of the instructor. PhD in Urban Planning and Policy students will generally take this course after or just before completing the preliminary examination.

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(s):** Consent of the instructor.

584 Methods of Policy Analysis 4 hours.
Analytic, allocative and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. **Same as** PPA 584. **Prerequisite(s):** Consent of the instructor.

586 Topics in Urban Planning Research 4 hours.
Course highlights research activities and opportunities related to research centers. May be repeated.

587 Planning and Policy Research Practicum 4 hours.
PhD students work with a faculty member on engaged research related to their discipline. The topic and scope is determined by mutual agreement.

Prerequisite(s): UPP 586 and consent of the instructor. Open only to PhD degree students.

588 Research Design and Evaluation 4 hours.
Methods used to evaluate policies and programs; quasi-experimental designs, valuation problems, and emerging evaluation methods. **Prerequisite(s):** Consent of the instructor.

589 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(s):** UPP 503.

591 Professional Practice Experience 4 hours.
Reviews issues and problems in professional practice; analyzes prerequisites for rational, strategic, and ethical planning; considers career options; defines professional goals. Includes professional experience for students without professional planning experience. **Prerequisite(s):** Graduate standing in Urban Planning and Policy and an approved internship agreement or waiver of the internship.

593 Independent Research in Urban Planning and Policy 1 TO 8 hours.
Advanced study and analysis of a topic selected by a student under the guidance of a faculty adviser. Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

594 Topics in Urban Planning and Policy 1 TO 4 hours.
Intensive analysis of selected planning problems or policy issues. May be repeated to a maximum of 12 hours. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

596 Independent Study in Urban Planning and Policy 1 TO 4 hours.
Advanced study and analysis of topic selected by student under the guidance of faculty adviser. May be repeated. Students may register in more than one section per term. **Prerequisite(s):** Consent of the instructor.

597 Master's Project Research 0 TO 4 hours.
Preparation of plan, research report, or other document which demonstrates readiness for professional planning responsibility. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Open only to degree candidates, upon approval of student's faculty adviser.

598 Master's Thesis Research 0 TO 16 hours.
Preparation of a major research paper under the guidance of a faculty committee. Satisfactory/Unsatisfactory grading only. **Prerequisite(s):** Open only to degree candidates, upon consent of the director of graduate studies.

599 PhD Thesis Research 0 TO 16 hours.
Individual study and research. Satisfactory/Unsatisfactory grading only. May be repeated. **Prerequisite(s):** Open only to degree candidates, upon approval of topic by the dissertation committee.

Women's Health Nursing (NUWH)

450 Women and Mental Health Nursing 3 hours.
Theories of female psychology; women's daily lives and mental health; gender differences in mental illness; strategies for improving women's mental health. **Same as** GWS 450 and NUSC 450. **Prerequisite(s):** 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 or GWS 315.

455 Women's Health: A Primary Healthcare Approach 3 hours.
Health promotion and disease prevention in women's health. Includes community experience with community women. Primary healthcare approaches examined. **Same as** CHSC 456 and NUSC 455. **Prerequisite(s):** Consent of the instructor.

507 Biological Basis for Women's Health and Perinatal Nursing I 2 hours.
Focuses on the anatomy and physiology of reproductive function, pregnancy, parturition, the puerperium, and menopause as the biological basis for women's health and perinatal nursing. **Same as** NUMC

507. **Prerequisite(s):** Consent of the instructor.

**517
Healthcare of
Women I 4 hours.**

Healthcare of women through the life span with an emphasis on health promotion and disease prevention, fertility control, and pregnancy care.

Same as NUMC 517.

Prerequisite(s): Credit or concurrent registration in NUMC 507 or credit or concurrent registration in NUWH 507, and credit or concurrent registration in NUSC 532, or consent of the instructor.

**518
Healthcare of
Women II 4 hours.**

Healthcare of women through the life span with an emphasis on the parturition, the puerperium, and common health and pregnancy problems. **Same as** NUMC 518.

Prerequisite(s): NUMC 508; and NUMC 517 or NUWH 517, or consent of the instructor.

**519
Healthcare of
Women III 4 hours.**

Healthcare of women through the life span with an emphasis on gynecologic and primary care. **Same as** NUMC 519. **Prerequisite(s):** NUMC 518 or NUWH 518; and NUSC 531 and NUSC 532 and NUSC 535.

**550
Issues for Research
and Practice in
Women's Health 3 hours.**

Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women's healthcare practice are developed as a basis for research.

Same as NUSC 550.

Prerequisite(s): Consent of the instructor.

**555
Theories and Methods in
Women's Health
Nursing Research 3 hours.**

Critical analysis of theoretical and methodological approaches in women's health nursing research. Emphasis on evaluation schema useful to researchers. **Same as** NUSC 555. **Prerequisite(s):**

NUSC 550 or NUWH 550, and consent of the instructor.

**565
Advanced Research
in Women's
Health 1 TO 2 hours.**

Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique ongoing and developing research.

Same as NUSC 565.

Prerequisite(s): Consent of the instructor.

**570
International
Dimensions in
Women's Health 3 hours.**

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. **Same as** NUSC 570. **Prerequisite(s):** Consent of the instructor.

**575
Minority Women's
Health Nursing 3 hours.**

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. **Same as** NUSC 575. **Prerequisite(s):**

Consent of the instructor.



Index

A

Academic calendar (inside front cover)
 Academic Grievance Procedures, 27
 Academic integrity, 27
 Academic year, 15
 Accounting
 Courses, 163–164
 Degree programs, 67
 Faculty, 35
 Accreditation, 9–10
 Adding/dropping courses, 20
 Adding programs, 18
 Administration, 10
 Administrative Studies in Nursing
 Courses, 164
 Admissions, 16
 Advisers, 20
 African-American Studies
 Courses, 164–165
 Faculty, 38
 Anatomy and Cell Biology
 Courses, 165
 Degree programs, 131
 Faculty, 43
 Ancient Greek
 Courses, 165
 Animal research, 29
 Anthropology
 Courses, 165–168
 Degree programs, 103–104
 Faculty, 39
 Application procedures, 16–18
 Applied Health Sciences, College of
 Degree programs, 49–58
 Faculty, 34
 Architecture
 Courses, 168–170
 Degree program, 59–60
 Faculty, 34
 Architecture and the Arts, College of
 Degree programs, 59–66
 Faculty, 34–35
 Art and Design
 Courses, 171–173
 Faculty, 34
 Art History
 Courses, 173–174
 Degree programs, 60–61
 Faculty, 34–35
 Asian Studies
 Courses, 174–175
 Assistantships, 19
 Associated Health Sciences
 Courses, 175

B

Biochemistry and Molecular Genetics
 Courses, 175–176
 Degree programs, 132
 Faculty, 43
 Bioengineering
 Courses, 176–178
 Degree programs, 87–88
 Faculty, 37
 Bioinformatics
 Degree programs, 88–89
 Biological Sciences
 Courses, 178–180
 Degree programs, 104–105
 Faculty, 39
 Biomedical and Health Information Sciences
 Courses, 180–181
 Faculty, 34
 Biomedical Visualization
 Courses, 181–182
 Degree program, 49
 Biopharmaceutical Sciences
 Courses, 182–184
 Degree programs, 145
 Faculty, 46
 Biophysics. *See* Physiology and Biophysics
 Biostatistics
 Courses, 184–185
 Board of Trustees Tuition and Service Fee Waiver, 19
 Business Administration
 Courses, 185
 Degree program, 68
 Business Administration, College of
 Degree programs, 67–73
 Faculty, 35

C

Calendar, academic (inside front cover)
 Campus Certificate Programs, List of, 8
 Changing programs, 18
 Chemical Engineering
 Courses, 185–186
 Degree programs, 89–90
 Faculty, 37
 Chemistry
 Courses, 186–189
 Degree programs, 105–106
 Faculty, 39
 Civil Engineering
 Courses, 189–191
 Degree programs, 90
 Faculty, 37
 Classics
 Courses, 191–192
 Faculty, 39
 Committee on Institutional Cooperation
 Courses, 192

Traveling Scholar Program, 20
 Communication
 Courses, 192–193
 Degree program, 106–107
 Faculty, 39
 Community Health Sciences
 Courses, 193–195
 Computer Science
 Courses, 195–197
 Degree programs, 91–92
 Faculty, 37
 Confidentiality of records, 27–28
 Course descriptions, 161–307
 Course loads, 21–22
 Criminal Justice
 Courses, 197–199
 Degree programs, 107–108
 Faculty, 39–40
 Curriculum and Instruction
 Courses, 199–202
 Degree program, 77–78

D

Degree programs, List of, 6–8
 Degree requirements, 24–27
 Dentistry, College of
 Degree programs, 75–76
 Faculty, 35–36
 Directions to campus, 311
 Directors of Graduate Studies (DGS), 15
 Disabilities, students with, 29
 Disability and Human Development
 Courses, 203–204
 Degree program, 50
 Faculty, 34
 Disability Studies
 Courses, 204–205
 Degree program, 51
 Discipline of students, 30
 Dissertation, 27
 Doctoral degrees
 List of, 6–8
 Requirements, 25–27

Dropping/adding courses, 20

E

Earth and Environmental Sciences
 Courses, 205–207
 Degree programs, 108–109
 Faculty, 40
 Economics
 Courses, 207–209
 Degree programs, 69–70
 Faculty, 35
 Education, College of
 Courses, 209–210
 Degree programs, 77–85
 Faculty, 36
 Educational Psychology
 Courses, 210–212

Degree program, 78–79
 Electrical and Computer Engineering
 Courses, 212–215
 Degree programs, 92–94
 Faculty, 37–38
 Electronic Visualization
 Degree program, 61–62
 Engineering, College of
 Courses, 215
 Degree programs, 87–97
 Faculty, 37–38
 English
 Courses, 215–219
 Degree programs, 109–111
 Faculty, 40
 English as a Second Language (ESL)
 Courses, 220
 Enrollment, 20–22
 Entrepreneurship
 Courses, 220
 Environmental and Occupational Health Sciences
 Courses, 220–222
 Environmental and Urban Geography
 Degree program, 111–112
 Epidemiology
 Courses, 222–223
 Examinations
 Doctoral, 26
 Master's, 25

F

Faculty, List of graduate, 34–48
 Fees and tuition, 30–32
 Fellowships, 19
 Film/Animation/Video
 Degree program, 62–63
 Finance
 Courses, 223–224
 Faculty, 35
 Financial aid, 18–20
 Financial obligations, 30, 32–33
 Forensic Science
 Degree program, 145–146
 French
 Courses, 224–226
 Degree program, 112–113
 Faculty, 42

G

Gender and Women's Studies
 Courses, 226–227
 Faculty, 40
 Interdepartmental Concentration, 113
 Geography
 Courses, 227–229



- Germanic Studies
Courses, 229–230
Degree programs,
114–115
Faculty, 40
- Grades, 22
- Graduate College
Courses, 231
Degree programs,
99–100
General information,
15–33
Interdepartmental
Concentrations,
100–101
- Graduate Education in Medical
Sciences (GEMS)
Degree programs,
133
- Graduate study
By undergraduates, 16
- Graphic Design
Degree program,
63–64
- Grievance procedures, 27,
28–29
- H**
- Health Informatics
Degree programs,
51–53
- Health Policy and
Administration
Courses, 231–233
- Health Professions Education
Degree program,
133–134
- Healthcare Administration
Degree program, 151
- Hispanic Studies. *See also*
Latin American and Latino
Studies
Degree program,
115–116
- Histology
Courses, 233–234
- History
Courses, 234–236
Degree programs,
116–118
Faculty, 40–41
- Honors College
Courses, 236
- Hours, campus, 15
- Human Nutrition
Courses, 237
Degree programs,
53–54
Faculty, 34
- Human research, 29
- I**
- Illinois Veterans Scholarship, 20
- Immunization requirements,
28
- Immunology. *See* Microbiology
and Immunology
- Industrial Design
Degree program, 64
- Industrial Engineering
Courses, 237–239
Degree programs,
94–95
- Faculty, 38
- Information and Decision
Sciences. *See also*
Management Information
Systems
Courses, 239–242
Faculty, 35
- Instructional Leadership
Degree program,
79–81
- Interdisciplinary Public Health
Sciences
Courses, 242
- Interdisciplinary Studies in the
Arts
Courses, 242
- International applicants,
17–18
- Italian
Courses, 242–243
- J**
- Jane Addams College of Social
Work. *See* Social Work
- Jewish Studies
Courses, 243
- Joint degree programs,
List of, 8
- L**
- Latin
Courses, 243
- Latin American and Latino
Studies. *See also* Hispanic
Studies
Courses, 243
Faculty, 41
Interdepartmental
Concentration, 118
- Leave of absence, 22–23
- Liberal Arts and Sciences,
College of
Courses, 243
Degree programs,
103–130
Faculty, 38–42
Interdepartmental
concentrations, 113,
118, 126–127
- Life Sciences, Graduate
College
Courses, 231
- Limited status, 16
- Linguistics
Courses, 243–244
Degree program, 119
- Lithuanian. *See also* Slavic
Languages and Literatures;
Slavic Studies
Courses, 244–245
- Loans, 20
- M**
- Management Information
Systems. *See also*
Information and Decision
Sciences
Degree programs,
70–72
- Managerial Studies
Courses, 245–246
Faculty, 35
- Maps of campus, 312–315
- Marketing
Courses, 246–248
- Master of Business
Administration
Courses, 248
Joint degree
programs, List of, 8
- Master's degrees
List of, 6–8
Requirements, 25
- Materials Engineering
Courses, 189–191
Degree programs,
95–96
Faculty, 37
- Maternal-Child Nursing
Courses, 248–249
- Mathematical Computer
Science
Courses, 249–251
- Mathematics. *See also*
Computer Science; Statistics
Courses, 251–254
Degree programs,
120–122
Faculty, 41
- Mathematics Teaching
Courses, 254–255
- MD/PhD Training Program
Degree program,
134–135
- Mechanical Engineering
Courses, 255–258
Degree programs,
96–97
Faculty, 38
- Medical Biotechnology
Courses, 258–259
Degree program,
135–136
- Medical Education
Courses, 259
Faculty, 43
- Medical Humanities
Courses, 259
- Medical immunization
requirements, 28
- Medical Laboratory Sciences
Courses, 259–260
- Medical-Surgical Nursing
Courses, 260–261
- Medicinal Chemistry
Courses, 261
Degree programs,
146–147
Faculty, 46
- Medicinal Chemistry and
Pharmacognosy. *See also*
Pharmacognosy
Courses, 261–262
Faculty, 46
- Medicine, College of
Degree programs,
131–139
Faculty, 43–45
- Microbiology and Immunology
Courses, 262
Degree programs,
136–137
Faculty, 43–44
- Military service, 32
- Movement Sciences
Courses, 262–264
Degree programs,
54–55
Faculty, 34
- Music
Courses, 264
- N**
- Native American Studies
Courses, 264
- Natural Sciences
Courses, 264
- Neuroscience
Courses, 264
Degree programs,
99–100
Faculty, 38
Interdepartmental
Concentration, 100
- Nondegree admissions, 18
- Nondiscrimination policy, 28
- Nursing, College of
Degree programs,
141–144
Faculty, 45–46
Interdepartmental
Concentration, 144
- Nursing Science
Courses, 265–267
Degree programs,
141–144
Faculty, 45–46
- O**
- Occupational Therapy
Courses, 267–270
Degree programs,
55–57
Faculty, 34
- Oral and Maxillofacial Surgery
Courses, 270
Faculty, 36
- Oral Medicine and Diagnostic
Sciences
Courses, 270
Faculty, 36
- Oral Sciences
Courses, 270–271
Degree programs,
75–76
- Orthodontics
Courses, 271
Faculty, 36
- P**
- Parking facilities, 311
- Pathology
Courses, 271–272
Faculty, 44
- Pediatric Dentistry
Courses, 272
Faculty, 36
- Petitions, 23
- Pharmacognosy
Courses, 272–273
Degree programs,
148–149
Faculty, 46





- Pharmacology
 Courses, 273
 Degree programs, 137–138
 Faculty, 44
- Pharmacy
 Courses, 273–274
 Degree programs, 149
 Faculty, 46
- Pharmacy, College of
 Degree programs, 145–150
 Faculty, 46
- Pharmacy Administration
 Courses, 274
 Faculty, 46
- Pharmacy Practice
 Courses, 274
 Faculty, 46
- PharmD/PhD, Joint program
 Degree program, 149–150
- Philosophy
 Courses, 275–277
 Degree programs, 122–123
 Faculty, 41
- Photography
 Degree program, 65
- Physical Therapy
 Courses, 277–278
 Degree program, 58
 Faculty, 34
- Physics
 Courses, 278–279
 Degree programs, 123–124
 Faculty, 41–42
- Physiology and Biophysics
 Courses, 279–280
 Degree programs, 138–139
 Faculty, 44
- Policy Studies in Urban Education. *See also* Urban Education Leadership
 Courses, 280–282
 Degree program, 81–82
- Polish. *See also* Slavic Languages and Literatures; Slavic Studies
 Courses, 282
- Political Science
 Courses, 282–284
 Degree programs, 124–125
 Faculty, 42
- Postsecondary credentials, 17
- Probation, 20–21
- Programs, Adding or changing, 18
- Prosthodontics
 Courses, 284
- Psychiatric Nursing
 Courses, 284–285
- Psychology
 Courses, 285–288
 Degree programs, 125–126
 Faculty, 42
- Public Administration
 Courses, 288–291
 Degree programs, 157–158
 Faculty, 47
- Public Formal Grievance
 Procedures, 28–29
- Public Health Nursing
 Courses, 291
- Public Health, School of
 Degree Programs, 151–154
 Faculty, 46–47
- Public Health Sciences
 Degree Programs, 152–154
 Faculty, 46–47
- Public Policy Analysis
 Courses, 291–292
-
- R**
- Real Estate
 Degree program, 73
- Refunds, 32–33
- Registration, 23–24
- Religious Studies
 Courses, 292
- Research centers and institutes, 14
- Research on humans or animals, 29
- Rubrics, List of, 161–162
- Russian. *See also* Slavic Languages and Literatures; Slavic Studies
 Courses, 292
-
- S**
- Second Language Teaching
 Interdepartmental Concentration, 126–127
- Sexual harassment policy, 29–30
- Slavic Languages and Literatures
 Courses, 293
 Degree program, 127–128
 Faculty, 42
- Slavic Studies
 Courses, 293
 Degree program, 128–129
 Faculty, 42
- Social Work, Jane Addams College of, 155
 Courses, 294–296
 Degree program, 155
 Faculty, 47
- Sociology
 Courses, 296–298
 Degree programs, 129–130
 Faculty, 42
- Spanish. *See also* Hispanic Studies
 Courses, 298–299
 Faculty, 42
- Special Education
 Courses, 300–302
 Degree programs, 82–84
- Statistics. *See also* Mathematics
 Courses, 302–303
- Student Disciplinary Procedures, 30
- Studio Arts
 Degree program, 65–66
- Surgery
 Courses, 303
 Degree program, 139
 Faculty, 45
- Survey Research Methodology
 Interdepartmental Graduate Concentration, 101
-
- T**
- Teaching, by doctoral students, 27
- Test of English as a Foreign Language (TOEFL), 16, 17, 18
- Theatre
 Courses, 303–304
- Thesis, 25
- Traineeships, 19
- Transcripts, 33
- Transfer credit, 24
- Tuition and fees, 30–32
-
- U**
- Undergraduates, graduate study by, 16
- University Library
 Faculty, 48
- University regulations, 27–30
- Urban Education Leadership. *See also* Policy Studies in Urban Education
 Degree program, 84–85
- Urban Planning and Policy
 Courses, 304–306
 Degree programs, 159–160
 Faculty, 47–48
- Urban Planning and Public Affairs, College of
 Degree programs, 157–160
 Faculty, 47–48
-
- V**
- Veterans, 20
-
- W**
- Withdrawal from the university, 32
- Women's Health
 Interdepartmental Graduate Concentration, 144
- Women's Health Nursing
 Courses, 306–307
- Work study, 20
-
- Z**
- Zero hours, 23